EDITORIAL

The G. M.-Vauxhall Deal

GENERAL MOTORS now controls Vauxhall. The British motor press which heaved a sigh of relief when the General Motors-Austin deal fell through will have to steel itself to disappointment all over again.

It is difficult for most American executives to realize the extent to which a certain kind of patriotism is a factor in influencing British business opinion. A parts salesman using an American car in calling on a British car manufacturer not long ago, received a printed form letter from that manufacturer not long after his visit stating in effect that if he wanted to sell anything to this particular manufacturer he had better start using a British car in making his rounds. That the letter was printed indicated that it was the result of a studied policy rather than a whim of the moment on the part of the sender. But proposals to sell out to American interests still are coming both from England and from the Continent.

There is no reason to believe, however, that American attempts to buy foreign automobile factories are in any sense an attempt to injure the foreign makers; it would seem to be simply a feasible method of obtaining facilities needed in the general extension of American foreign trade. In the Vauxhall case, certainly British workers must man the plants still; British dealers will benefit if more sales result from the merger; the British Government will collect more taxes from whatever increase in profits may accrue; and the British public will benefit from any lowering of price or increasing of quality which may result.

It is safe to say that a sincere desire to assist rather than to dominate the British industry, as well as to make profit, will accompany any American moves abroad.

Air Squabble in France

IF Col. Mitchell's accusations against the administration of the Air Services are proved we may still have the small consolation that there are others who are just as bad. The recent statement by Gen. Faschet concerning the administration of the French Air Service is substantiated by an editorial in a recent issue of L'Aero-Sports.

The writer quotes extensively from Col. Mitchell's statement in which he lays the blame for the many recent accidents to aircraft on the Air Service administration. Then he writes that if by some postal mistake this statement had been received at l'Avenue Rapp, the French Air Minister's headquarters, instead of Washington, the former would not have been able to write "Wrong address" on the envelope and send it on because the situation in France is just the same except that there has been no one to raise his voice in calling the people's attention to it.

Because the present French Air Minister comes from the territory that gave birth to Lafayette the writer expresses the wish that as Lafayette's ships crossed the seas in the name of Liberty so may Col. Mitchell's words cross in the other direction in the name of Truth.

There may be some small solace for us in the realization that, although our aeronautical affairs may not be handled in the best manner, the country which, in the popular mind, has the best and biggest air force in the world is having troubles very similar to ours.

England's Gear-Shift Problem

GREAT BRITAIN is in the midst of a problem which was solved in this country long ago—solved, apparently, to the satisfaction of both automobile manufacturers and users. Where should the gear shift and hand brake levers be located? In the center or at the side of the front compartment? This is the question which is now puzzling Britishers and present indications are that it will be finally answered by employing the side location.

The two main benefits which have influenced the adoption of the central location in this country are ease in manufacture and clearing the entrance to the driver's seat. These factors are important in Great Britain but against them are arranged the facts that the central location breaks up the front compartment to such an extent that the full seating capacity of the front seat cannot be utilized easily and the application of floor coverings is made more difficult. It is true that while most American cars have front seats of ample width for three persons, the central location makes gear shifting or application of the hand brake rather inconvenient when the full load is carried. In England the seats are generally narrower and this is, apparently, the controlling factor which has produced the present definite trend toward side location. Of course, with their many cars of small power, gear shifting is of much more importance than in this country, where traffic halts or similar delays are about the only occasions which require gear changes.

British designers have realized the difficulty of locating the levers at the right side of the driver so that the entrance is not blocked and have developed methods, quite noticeable in some new models, which put the controls within easy reach of the driver but so arranged that they obtrude but little into the space required for entrance and exit.

Our Industry Today

October Production Total Sets New Record of 454,327 Units

NEW YORK, Nov. 5—A new high production record for the automobile industry for all time was set in October, according to the preliminary estimate of the National Automobile Chamber of Commerce, which gives 454,327 as the total of car and truck output. This compares with 439,125 in April, 1925, the best previous month, and with 332,759 in September, 1925, and 293,356 in October, 1924.

The total production for the first ten months of the current year is thus brought to 3,620,468, or within 20,000 of the 1924 total. There is now no doubt that the record for a year's production, set up in 1923 with a total of 4,086,997 cars and trucks, will be beaten this year.

It is likely that a fairly even course will be continued during the remainder of the year, with only a gradual decline in production. Dealers will go into the new year with substantial stocks on hand, but not with excessive surpluses unless there is a big drop in demand during the next two months which is not compensated by corresponding curtailment at the factories.

Third Quarter Earnings Good

Third quarter earnings statements now being made public are revealing some astonishing facts. Despite the price cuts made by the companies during the summer, and effective on most of the cars produced during the third quarter, earnings were substantially as high as during the second quarter, and in one or two outstanding instances, profits per unit of output were actually higher. These represent production economies that were made apparently without damaging the appearance of the cars or weakening them mechanically. Costs of closed bodies have been brought down as a consequence of the much larger volume of demand for closed cars.

The parts companies, on the whole, have not come out of the price-cutting period so well as the car makers. The latter, in some instances, have dealt rather harshly with their parts suppliers, who, frequently, are in the unenviable position of having to renew contracts at cost or scrap machinery.

Truck and bus production and sales are continuing without noticeable abatement at record high levels.

Haynes Denies Merger Rumor

NEW YORK, Nov. 2—F. J. Haynes, president, Dodge Bros., Inc., on his return from abroad, denied rumors which have been current recently that his company was to acquire the Paige-Detroit Motor Car Co. Mr. Haynes stated that 275,000 cars would be turned out this year, and 300,000 next year.

Sales Still Above Normal for Season

Survey Shows Good Condition —Used Car Stocks Increase —Trucks Active

PHILADELPHIA, Nov. 3—High lights of the automotive sales situation, as revealed by correspondents in key cities, are as follows:

1. In most sections new cars are selling at somewhat above normal seasonal level.
2. No abatement in truck sales is noted and demand for light commercial vehicles is particularly strong in rural districts.
3. The used car situation is the weak point in most sections of the country.
4. A few complaints of inability to obtain deliveries are still heard.
5. Sales of parts are unusually good, considering the season, and radio, now an important line with many automotive jobbers and dealers, is booming.

As might be expected, conditions the country over are by no means uniform. Weather conditions are now exercising a potent influence on buying.

Weather a Factor

There has been a general slowing down of motor sales in Boston during the latter part of October. In the middle of the month, New England was swept with a snow storm which seemed to put a blanket upon activities. Distributors found that their outside dealers were not moving cars very well.

In some parts of the Mississippi Valley bad weather appears, also, to have adversely affected the market, but, taking the country as a whole, there are few complaints of bad business.

The warning of what may, perhaps, become a general tendency may be seen in the following news from Dallas, Texas: "Dealers stocks are slightly increased over those carried in September. Factories are inclined to push cars to dealers."

With the possible exception of New England, there appears a quite general feeling among distributors and dealers

(Continued on page 805)

241,027 FORDS SETS NEW MONTHLY RECORD

DETROIT, Nov. 4—Total October production in the United States and Canada by the Ford Motor Co. set a new monthly record for the industry. In that month, 214,087 cars and trucks were produced. Output plans for the present month of both companies call for a production greatly in excess of even these figures.

A new daily production record was set on Oct. 31, when domestic production figures were 9,109 cars and trucks.

"This remarkable industrial achievement," a company statement declared, "becomes more important when it is recalled that, sixty days ago, assembly of cars had halted while materials for the improved types were being shipped to branches. Since that time, production has steadily risen from practically nothing to record-breaking heights."

A.A.A. Announces Racing Standards

WASHINGTON, Nov. 4—Racing cars in 1926 will be equipped with engines of approximately half the piston displacement of a present day Ford car, is is announced here by the contest board of the American Automobile Association. The new maximum displacement will be 91½ cu. in. as compared with the present maximum displacement of 122 cu. in. The Ford engine has a displacement of 176.7 cu. in.

Employment in Detroit

DETROIT, Nov. 2—Employment in the Detroit area for the week ended October 27 reached a total of 266,748, an increase of 495 over the previous week. This is the largest employment figure of the year. While these figures are not an accurate check on the employment in the various automotive lines in this area, they can be construed as fairly authentic, for several large automobile and accessory manufacturing plants' employment figures are contained in them, and these firms are the largest employers in this area.

Increases Truck Output

EVANSVILLE, Ind., Nov. 2—The local truck building plant of Graham Bros. has stepped up production from 45 to 75 trucks per day, according to announcement by J. A. Merchant, assistant secretary.

A.E.A. Meeting and Exhibit in Chicago

Manufacturers and Wholesalers Will Gather Nov. 9—Program Outline

CHICAGO, Nov. 4—Next week will see the gathering here of manufacturers and wholesalers for the Tenth Annual Convention and Seventh Business Exhibit of the Automotive Equipment Association in the Coliseum.

The convention in general will follow the usual form of procedure, with group meetings of wholesalers and manufacturers and general sessions in which the entire body will pass on the recommendations of these groups. Several innovations will be introduced, including a day set aside for car manufacturers, service men and Society of Automotive Engineers members. The program contains but one scheduled speech, that of William J. Wooley, vice president and general manager of the Wolff Manufacturing Co., makers of plumbers' supplies in Chicago. Mr. Wooley for the last six years has been general manager of the National Trade Extension Bureau and has directed all the merchandising activities of the combined association in the plumbing field. His subject will be "It Pays to Ask 'Em to Buy."

The business exhibit this year will be one of the largest in the history of the association, containing 225 exhibits by leading manufacturers of the automotive equipment field. The show will be open throughout the week, with attendance of delegates from 2:30 to 5:30 on Tuesday, Wednesday, Thursday, Friday and Saturday. There will be the annual banquet on Thursday night in the Gold Room of the Congress Hotel.

The convention will be presided over by Commissioner W. M. Webster, assisted by W. T. Morris, president of the A. E. A.

Operators Confer on Bus Legislation

WASHINGTON, Nov. 4—Confidence that the bus operators of the country will be able to reach an accord with the other bodies interested in the question of legislation for the regulation of passenger motor vehicle common carriers engaged in interstate commerce was expressed by representative bus operators from various parts of the country, following a two-day conference held this week at the National headquarters of the American Automobile Association. Among these bodies are the National Association of Railway and Public Utility Commissioners, the American Railway Association and the American Electric Railway Association.

The conference is one of a series in which the bus operators are participating in order that they may develop a harmonious stand on a legislative program of regulation suitable to the needs of common carriers engaged in the business of motor transportation. The next meeting of the committee will be held in Detroit in connection with the National Motor Bus Show, November 16-21.

Paige-Detroit Busy Remodeling Plant

DETROIT, Nov. 2—Upwards of $300,000 has been spent in erecting new buildings in preparing for the new automobile which will shortly be brought out by the Paige-Detroit Motor Car Co. Nothing has been revealed other than it is a six-cylinder car which will sell at a lower price than the present line of cars.

The largest building to be erected is for material storage, the dimensions being 530 by 70 feet. Other buildings will be for nickel plating and for riveting of frames for the new models. Additions are being made to the power house which include a new boiler unit. An air compressor building is also under way which will house four large compressors.

In the main assembly buildings, a motor conveyor capable of handling 300 motors every eight hours has been installed. The motor paint oven has been increased, as has been the chassis assembly conveyor. The two final assembly conveyors have been remodeled to handle the new models.

Brill Purchases Motor Bus Lines

RALEIGH, N. C., Nov. 2—North Carolina will not concern itself with the prospective consolidation of numerous major bus lines operated within the State, according to R. O. Self, bus commissioner of the State corporation commission. This was stated in Mr. Self's comment on the purchase, for $240,000, by J. G. Brill Co., of Baltimore, Md., of three bus lines operating between Raleigh and Greensboro. The Brill Co. outbid the Southern Railway for these lines, which the former will operate as the nucleus of a great consolidation. Options already have been obtained on several other trunk bus lines by the Brill Co., it was understood.

Hoff Co. Opens Its Western Sales Offices

CHICAGO, Nov. 4—Western sales offices of the Hoff Metal Products Co. have been opened in the McCormick Bldg. here and Fred W. Kohl is in charge.

During A.E.A. show and convention week, the Hoff Co., manufacturer of Hoff tire chains, will maintain headquarters at the Blackstone Hotel. In attendance will be Howard Wilcox, vice-president; E. E. Arnold, sales manager; Fred W. Kohl, B. R. Engelmann, Ashley H. Kilburn, E. L. Thompson and A. E. Joyce.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Nov. 4—A moderately rising trend still characterizes most lines of industrial and trade activity. Commodity prices recovered rather sharply after many weeks of unsettlement.

CAR LOADINGS

Car loadings in the week ended October 17 numbered 1,106,114, as compared with 1,106,099 in the preceding week and 1,102,336 in the corresponding period last year. Early reports of railway earnings for September indicate that the month's net may set a new record. Estimates have run as high as $132,000,000, which compares with the present record of $127,000,000, established in October, 1924.

COAL PRODUCTION

Production of bituminous coal in September is estimated at 46,817,000 tons, representing an averge daily output of 1,843,200 tons. This compares with a daily average of 1,726,000 tons in August and 1,522,400 in July.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended October 28 were 9.5 per cent smaller than the total for the preceding week, but 20.6 per cent above that for the corresponding period last year.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 157.9 last week, as against 156.1 a week earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks increased $20,500,000 during the week ended October 28, with a decline of $13,000,000 in discounts, more than offset by gains of $35,500,000 in open market purchases, and $900,000 in Government securities. Note circulation declined $200,000, while deposits increased $13,300,000 and reserves $3,800,000. The reserve ratio declined from 72.6 to 72.5 per cent.

MEMBER BANKS' POSITION

Loans of reporting member banks increased $14,000,000 during the week ended October 21, with gains of $6,000,000 in loans secured by Government obligations and $72,000,000 in loans secured by stocks and bonds, and a decline of $64,000,000 in "all other" loans. Investments decreased $3,000,000, borrowing from Federal Reserve banks, $46,000,000, and net net demand deposits, $91,000,000, while time deposits gained $42,000,000.

MONEY

Little change was apparent in the money market last week. Call loan rates ranged from 4¼ to 5 per cent. as against 4 to 5 per cent a week earlier. Time loan rates remained at 4¼ to 5 per cent and commercial paper rates at 4½ to 4¾ per cent.

Automotive Steel Demand Heavy

Desire to Avoid Transportation Delays Evident in Volume of Orders

NEW YORK, Nov. 4—Prices for nearly all metals and metal products, both ferrous and non-ferrous, are sloping upward, but, in most of the steel products, the higher levels named by producers still await the acid test of representative orders at these new figures. Current mill output and the bulk of that over the next two months is most likely to figure on sales books at the prices that prevailed previous to the advance, a considerable amount of business having been placed by consumers at the old levels when they were apprised by mills of the impending advances.

An Ohio producer has tacked an additional $2 per ton on to the previously announced advance in black sheets, making the base price 3.35c., Pittsburgh. Automotive orders have been gratifyingly large in number in the last few days, and there is a disposition on the part of buyers to buy in somewhat heavier tonnages, presumably so as to be prepared in the event of any seasonal transportation delays. Demand for strip steel from passenger motor car builders is very liberal, and some mills are now working overtime to expedite shipments. Cold-finished steel bars also come in for good inquiry. Finishers continue to complain that the spread between the price of their hot-rolled raw material and that of their cold-finished product is inadequate, and, what with the steel market's general tone of confidence, consumers may well interpret these complaints as the possible forerunners of upward revision of prices. There is no dodging the fact that the propaganda for a bull market has brought out considerable buying by consumers who were eager to get in under the wire ere prices move still higher. It is the same old story of a certain class of buyers who habitually turn their backs upon a market in which they virtually can have things their own way, and who buy freely as soon as prices have begun to rise.

The Metal Markets

Pig Iron—Several representative commitments from automotive centers are overhanging the market, one for 20,000 tons by a Detroit passenger motor car interest. Twenty dollars, valley, seems to have become an inside price for No. 2 foundry.

Aluminum—Importers quote for what limited tonnages of metal they have available for American delivery the same price level as the domestic producer who within the last few days is reported to have revised quotations upward to the extent of 1 cent per pound. The supply continues restricted, and for clean clippings as high as 25 cents has recently been paid by consumers.

Copper—The leading brass producer has revised prices for automotive brasses upward. The market for copper remains under the spell of foreign "bears" who oppose every advance.

Tin—Consumers are obliged to pay exorbitant prices, and so far there is no sign of relief.

Lead—Abnormally high prices continue because of the paucity in the supply and fairly heavy demand.

Zinc—High price levels still feature the market.

WILLYS-KNIGHT NEW MODELS ANNOUNCED

TOLEDO, Nov. 2—Two seven-passenger models, a touring and sedan, listing at $1,950 and $2,495 respectively, have been added to the Willys-Knight six-cylinder line, it was announced by the Willys-Overland Co., Inc. No changes have been made in the engine or chassis to accommodate the new body styles, except an increase in length of the rear springs. One of the more important changes in general appearance is the carrying of the spare rim on the left side, forward of the door.

New Hudson-Essex Financing Plan

DETROIT, Nov. 2—Aaron DeRoy, head of the Aaron DeRoy Motor Car Co., Hudson-Essex distributors in the Detroit area, has announced a new financing plan which will enable purchasers to buy Hudson and Essex cars for down payments of $290.00 and $195.00, respectively. The remaining amount is divided into sixteen equal monthly payments.

The plan, although looked upon with favor by Hudson-Essex factory officials, has not been extended to any other part of the country.

With the lowering of prices and the new financing plan, the Essex car goes directly into Ford territory, it being the theory of those behind the financing plan that anyone in the market for a Ford car can, for a little more money, buy an Essex coach. The working out of the plan is being watched with considerable interest.

Large Valve Order Placed

CLEVELAND, Nov. 2—What was said to be one of the largest orders placed with an automobile valve manufacturer, covering the first consignment of a quantity of 2,000,000 valves in a year, has been received by The Steel Products Co. It was announced that the valves were now being shipped at the rate of 40,000 a week.

The valve is known as the Thompson Silcrome Valve, a special development of the Thompson plant. It is now being made for sixty builders of American cars, trucks, tractors and airplanes.

Financing Problems Occupy Conference

Prominent Men to Discuss Important Questions at Chicago Meeting

CHICAGO, Nov. 3—The official program of the Second Annual Automotive Financing Conference has just been announced. The meeting, as previously stated in AUTOMOTIVE INDUSTRIES, will be held at the Hotel Sherman, Chicago, on Monday and Tuesday, Nov. 16-17, under the auspices of the National Association of Finance Companies.

The conference will be called to order by A. E. Brooker, president, N. A. F. C., and at the morning session automotive financing will be taken up from four different angles, namely, from the viewpoint of the finance company, by Henry Ittleson, president, Commercial Investment Trust, Inc., New York; from that of the banker, by A. W. Newton, vice-president, First National Bank, Chicago; from the standpoint of the dealer, by C. E. Gambill, Chicago, president, National Automobile Dealers Association; and from the viewpoint of the manufacturer, by A. R. Erskine, president, Studebaker Corp.

At the afternoon meeting on Monday, there will be a talk on "The Safety Zone of Automotive Financing" by C. C. Hanch, general manager, National Association of Finance Companies, and at night there will be the annual banquet, which will be of an informal nature.

Used Car Paper Considered

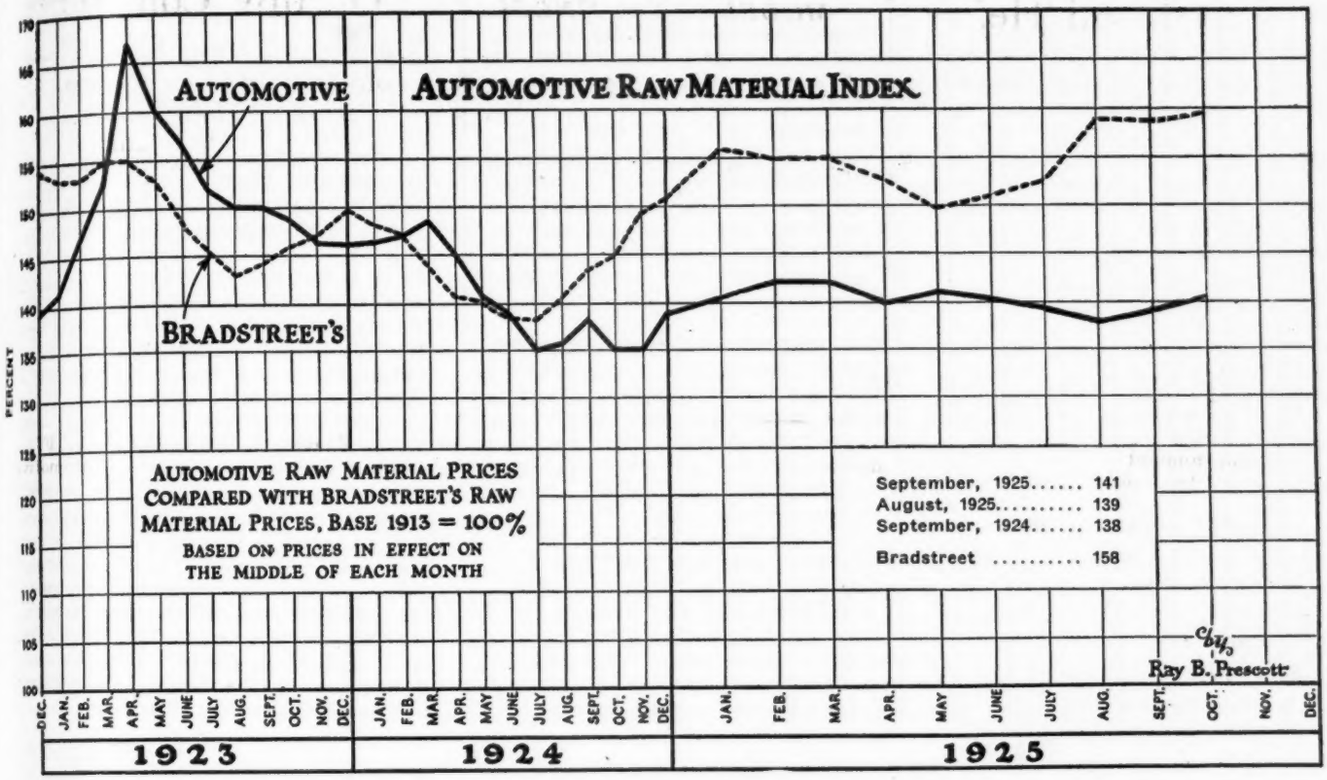
Tuesday morning four papers will be presented to the conference. The subject of used car paper, endorsed or not endorsed by the dealer, will be discussed by A. J. Morris, president, Industrial Acceptance Corp., New York, and by E. S. Hare, vice-president, Hare & Chase, Philadelphia. These will be followed by E. M. Morris, of South Bend, Ind., chairman, committee on legislation, N.A.F.C., who will talk on "National and State Legislation," and by J. T. Cronkhite, president, Commercial Securities Co., Wichita, Kan., who will take up the subject of "Interchange of Service between Finance Companies."

"Association Benefits" will be the topic of E. N. Smith, general manager, American Automobile Association, Washington, D. C., on Tuesday afternoon, and, after routine business has been transacted, the meeting will adjourn.

Addition to Diana Line

ST. LOUIS, MO., Nov. 2—A seven-passenger sedan finished in Brewster green Duco below the belt and black above, has been added to the Diana line. This body is mounted on a 135-in. wheelbase chassis with special springs. Upholstery is gray broadcloth and interior equipment includes vanity case and smoking set.

September Raw Material Prices Advance



Firestone Extends Rubber Operations

To Develop Fields in Mexico and Brazil, in Addition to Liberian Plans

AKRON, Nov. 3—Harvey S. Firestone, president of the Firestone Tire & Rubber Co., announced today that he was planning to extend his operations to every part of the world where there is a possibility of growing crude rubber for American consumption under favorable conditions.

In addition to the Liberian project, where work has just been started on a $100,000,000 development program, Firestone's latest activity is the leasing of 35,000 acres of rubber plantation land in the province of Tobasco, Mexico. For several months the company has had forces at work in Tobasco, perfecting the organization of the huge plantation there. In that time, buildings and roads have been constructed, and Indian laborers brought in from the jungles of the isthmus of Tehuantepec.

To Grow Rubber in Brazil

In carrying out his policy that "America must produce its own rubber," Firestone said also he has plans under way for entering the rubber area in the Amazon River valley in Brazil.

Of the tract leased in Tobasco, 350 acres already are under cultivation. Besides a two-year lease, the company holds an option to purchase the land, which undoubtedly will be exercised if the experiment is a success. Research work will be carried on by Firestone engineers in an attempt to increase the yield of rubber trees and the quality of the product. Experiments are to be conducted particularly in the sap of the Castilloa tree, at present considered only as a source of low grade rubber.

Rubber Production's Gain Unimportant

NEW YORK, Nov. 2—Rubber authorities here do not believe that the latest increase of 10 per cent in the amount of crude rubber permitted by the British to be produced under the Stevenson Restriction Act will have any appreciable effect on the world market. Dealers' average stocks of casings are only slightly larger than a year ago, but inner tube stocks are much heavier, according to a revised report of the Department of Commerce, made public today.

Returns from 35,331 dealers, as of Oct. 1, show 2,000,150 casings, or 56.6 per dealer, and 283,552 balloon casings, or 17.5 per dealer, compared with 1,402,879 casings, or 53.6 per dealer, and 135,366 balloon casings, or 16.3 per dealer, a year ago. Returns also show 3,486,120 inner tubes, or 99.1 per dealer and 53,060 solid and cushion tires, or 25 per dealer, as against 2,197,553, or 79.9 per dealer, and 1,449, or 21.1 per dealer, Oct. 1 last year. Consideration of these facts should be of help in planning tire and tube production for the next six months.

Deny Prediction of Petroleum Shortage

Bureau of Mines' Experts Call Sir Richard Redmayne's Prophecy Fallacious

WASHINGTON, Nov. 4—Flat denial of the pessimistic prophecy of Sir Richard Redmayne, British coal expert, that the petroleum supply of this country will be exhausted in twenty-five years was made here this week by Bureau of Mines' experts.

"The motorist of 1950," said the expert, "may be driving his car on 35-cent gas, but predictions that America's petroleum supply is to be exhausted, are unfounded."

One billion acres, or one-third the area of the country, show indications of oil, experts point out, and shale deposits are unlimited. It is estimated the shale in Indiana alone would produce ten billion barrels of petroleum and Indiana "is not a drop in the bucket."

Rickenbacker-Trippensee Combine Ratified

DETROIT, Nov. 2—Stockholders of the Rickenbacker Motor Co. have ratified the consolidation contract between that company and the Trippensee Closed Body Co. by more than a two-thirds vote. At the same meeting, stockholders approved the change in the par value of the stock from $10 to no par.

Truck Officials to Discuss Standards

Washington Meeting Will Hear Addresses on Many Phases of Subject

WASHINGTON, Nov. 4—Standardization of truck sizes and parts will be the principal topic here next week when the members of Motor Truck Industries, Inc., gather at the Department of Commerce, November 11 and 12.

The program on November 11 will include an opening address by R. M. Hudson, chief of the Division of Simplified Practice; an address by J. W. Stephenson, president of Motor Truck Industries, Inc., and also president of the Indiana Truck Co., Marion, Ind., and reports by the ratings and motor and accessories committees.

Committees to Report

The afternoon session will be opened by a brief address, followed by a discussion, opened and led by Brig. Gen. H. C. Smither, chief co-ordinator, Bureau of the Budget. Reports will be given by the committees on steering gear, axles, wheels and springs, transmission clutches and allied subjects. On Wednesday evening, there will be a banquet at the New Willard Hotel.

The session on November 12 will be opened by an address by Col. Chauncy B. Baker, U. S. A., retired, former chief of transportation. The other technical committees will make their reports, as well as the committees on sales and finance, and taxation. Dr. H. C. Dickinson, chief of the automotive research division, Bureau of Standards, will give an address, after which the delegates will go to the White House to be greeted by President Coolidge. The afternoon will be devoted to an inspection of the work of the Bureau of Standards.

Auburn Automobile Co. Statement

AUBURN, IND., Nov. 3—The statement of the Auburn Automobile Co., as of September 30, 1925, shows total assets of $3,219,093, current assets of $2,055,462, current liabilities, including $86,477 reserve for 1925 Federal taxes, of $680,932, and profit and loss surplus of $1,008,160. Capital stock outstanding amounts to 60,000 shares of $25 par value.

The balance sheet of the Auburn Automobile Co., as of September 30, 1925, follows:

Assets: Cash, $696,320; notes, accounts and accrued interest receivable, 450,319; inventories, $908,823; prepaid expenses, etc., $6,799; real estate, plant, equipment, etc., less depreciation, $522,805; goodwill, $634,027; total, $3,219,093.

Liabilities: Accounts payable, $315,160; sundry creditors, $35,164; accrued wages, etc., $141,225; dealers' deposits, $13,370; accrued State and local taxes, $41,756; other current liabilities, 47,781; reserve for 1925 Federal taxes, and advertising, 116,477; capital stock (represented by 60,000 shares, par $25) $1,500,000; profit and loss surplus, $1,008,160; total, $3,219,093.

AUTOMOBILE PAINTED WHILE YOU LUNCH

CLEVELAND, Nov. 2—Important developments in the painting of automobiles were prophesied at the annual meeting of the National Paint, Oil and Varnish Association held here.

R. W. Levenhagen, president of the Cleveland chapter of the National association, asserted that, in the near future, a new coat of paint on an automobile would be applied, dried and polished while the owner is eating his luncheon.

Space Assigned for Cleveland Car Show

CLEVELAND, Nov. 3—Cleveland distributors, dealers and manufacturers of passenger cars will be assigned space in the city's 1926 show today, it is announced by Herbert Buckman, manager of the Cleveland Automobile Manufacturers and Dealers Association, promoters of the exposition.

The annual show here has been set for Jan. 23-30, maintaining its usual chronological position between the New York and Chicago exhibits. Applications for space already are in the hands of the management for the following makes:

Ajax, Auburn, Buick, Chandler, Chrysler, Cleveland, Diana, Essex, Ford, Flint, Franklin, Hudson, Hupmobile, Jordan, Locomobile, Marmon, Moon, Nash, Oakland, Pierce-Arrow, Reo, Rolls-Royce, Stearns, Studebaker.

It is planned to have this year the most comprehensive display of motor transportation that has ever been offered here. More departments of the industry will be represented in the approaching exposition than in any previous show in the fifth city's history.

French Gasoline Pump

CINCINNATI, Nov. 2—Arrangements have been made by the Davis Welding & Manufacturing Co. of this city to manufacture a patented French gasoline-dispensing pump produced by the Hardoll Co., of Paris, a French valve and pump organization. The new pump is said to be capable of being operated twice as fast as any pump now in America and to be absolutely accurate in its measurement of gasoline. Jean Borotra, French tennis star, who recently won the Davis cup, is the general sales manager for the Hardoll Co. While in Cincinnati giving exhibition tennis games under the auspices of the Ohio Valley Tennis Association, Mr. Borotra completed his arrangements with the Davis Co. to produce and sell the new gasoline pump.

Dodge Announces New High Records

Number of Cars Sold, Gross Profits and Net Income Make Fresh Marks

NEW YORK, Nov. 5—New high records in the number of cars sold, gross profits, and net income for the first nine months of 1925 are announced by Dodge Bros., Inc., today.

Net sales were $175,284,031, against $155,170,714 in the corresponding period last year, and net income, after depreciation, but before interest on debentures, Federal taxes and dividends, was $25,435,427, as compared with $14,642,055 in the same period last year. After all charges, earnings equal $6.23 per share on 2,434,524 shares.

Third quarter earnings were $8,872,115, or $2.25 per share. The report shows that the company sold 203,546 cars in the first nine months of this year, exceeding any previous like period since 1914, when the company sold 249,000 cars to Sept. 30. The company has sold 1,430,961 cars for a total price for cars and parts of more than $1,229,000,000. Loss from debts amounted to only $33,000.

Ford of Canada Has Record Year

FORD CITY, ONT., Nov. 4—Seventy thousand eight hundred and sixteen passenger cars and 4,543 tractors were manufactured by the Ford Motor Co. of Canada during the twelve months ended July 31, according to an announcement made public by W. R. Campbell, vice-president and general manager.

Profits of the company in the last year amounted to $6,132,237.50, which was $2,413,139.99 more than the preceding year. The total assets of the company are listed at $41,419,335.66.

In the year ended July 31, the company expanded its activities and established two Australian companies, under the supervision of P. W. Grandjean, secretary and assistant treasurer. These were the Ford Manufacturing Co. of Australia, Ltd., and the Ford Motor Co., Ltd.

Brosseau to Preside

NEW YORK, Nov. 4—A. J. Brosseau, member of the Highways Committee and a director of the National Automobile Chamber of Commerce will preside at the afternoon session of the Fifth Annual Meeting of the Highway Research Board, Washington, D. C., December 3.

THOMAS HOOPES DEAD

WEST CHESTER, PA., Nov. 2—Thomas Hoopes, president of Hoopes Bros. & Darlington, manufacturer of wheels and spokes, died last week at his home here. He was 91 years old.

G. M. and Vauxhall Merger Progresses

New York Office Reports Probable Consummation, But No Official Statement Available

NEW YORK, Nov. 3—Although cable advices say that the merger of Vauxhall Motors, Ltd., of London, with General Motors was approved by Vauxhall stockholders late last week, General Motors headquarters here are not prepared to confirm the report today. It was said that the report was probably true, and that a statement might be forthcoming soon from General Motors. One section of Vauxhall stockholders opposed the merger, and thus reflected the opinion of the British trade press that the American automobile industry was seeking to capture English business. The opposition asked whether or not it was possible to obtain additional capital without going to the United States, and L. Walton, president, replied that the response to the last appeal for funds indicated that the shareholders lacked faith in their own company.

To Develop Existing Type

It is reported that three of the seven directors of the reorganized concern will be appointed by General Motors and that, in addition to providing new funds, General Motors is expected to develop the existing type of Vauxhall cars on a quantity production basis.

Overseas sales of General Motors in the third quarter this year exceeded the sales of any quarter in the corporation's history, as did total overseas sales for the first nine months of the year. Sales by General Motors Export Co. overseas distributors and dealers and by overseas assembly plants totalled 25,729 in the third quarter, and 67,583 in the first nine months of 1925, against 14,209 and 48,165, respectively, a year ago.

SHOCK ABSORBERS DISTRIBUTORS

BUFFALO, N. Y., Nov. 4—Houde Engineering Corp. announces the completion of negotiations with the Tractor Implement Equipment dealers for distribution of Model F Houdaille shock absorber for Fords. This association is now acting as distributing agents for the instrument with twenty-seven members covering territory located generally at points where the Ford Motor Co. has assembling plants. Larger car equipment will be handled from the Houde factory and through its authorized distributors as formerly.

CORPORATION MOVES

GREENFIELD, MASS., Nov. 3—Wells Tap & Die Corp. has established itself in new quarters, where machinery is being installed and tools and drop forgings have been made, preparatory to manufacturing taps, dies and screw plates. The concern will specialize in the automotive field and will manufacture a line designed to reach garagemen through the medium of the jobber and dealer.

F. O. Wells, former head of the Greenfield Tap & Die Corp., is manager; F. E. Wells, president, and W. S. Howe, also of the Production Machine Co., treasurer. These, with F. W. Wells, make up the concern. Production will be started about Jan. 1. The concern is in the same building where the concern of Wells Bros., eventually merged in Greenfield Tap & Die, was started almost 50 years ago.

PEERLESS ANNOUNCES NEW LIGHT-6 MODELS

CLEVELAND, Nov. 3—The new light-six model Peerless has been placed in production Nov. 1 and will be shown about Nov. 21, it was announced here lately by officials of the Peerless Motor Car Co., following a quarterly meeting of company directors.

Reports made showed "continuation of financial progress which the company has been making in past months." While no figures were made public, it is understood that the operations of the last quarter were satisfactory. Sales for the quarter were reported 70 per cent greater than sales for the corresponding period in 1924.

It was also announced that listing of the company's stock on the New York Stock Exchange was under official consideration.

Along with this announcement came word from factory executives that the coming Winter and Spring would witness little let-up, if any, in the present high scale of production.

Patent Decision Rendered

CHICAGO, Nov. 3—Federal Judge Johnson, at Ogden, Utah, has held as valid the patents covering the Monogram Original Self-Locking Radiator Cap, and has rendered a verdict in favor of the Kingsley-Miller Co., of this city, accordingly. Litigation in the case has been prolonged. The Barry-Macbeth Sales Co., of Ogden, was sued by Kingsley-Miller in an infringement suit, and Judge Johnson, in addition to the verdict rendered, has issue a permanent injunction against the Barry-Macbeth Sales Co., restraining them from the manufacture and sale of the Macbeth cap, or any other imitation of the Monogram Cap, that infringes Monogram's rights. An accounting was also ordered to determine the amount of profits and damages due the plaintiff.

COMPANY CHANGES NAME

CLEVELAND, Nov. 2—Folberth Auto Specialty Co., manufacturers of automatic windshield wipers, has changed its name to Folberth, Inc.

General Motors Has Paris Office

Incorporates Under French Law as Another Evidence of Foreign Expansion

PARIS, Oct. 24 (*by mail*)—General Motors (France) has just been formed under French laws, with a capital of 1,000,000 francs, and offices at 37, Boulevard Haussmann, Paris, for the sale of automobiles and accessories manufactured by the General Motors Corp. of America. The directors of the French company are J. D. Mooney, president General Motors Export Corp., of New York; Homer Zimmermann, of Copenhagen; Paul Buergin and William T. Hallen, of Antwerp, and Morris K. Clark, of Paris.

In the last few months, American automobile sales rooms have made their appearance in important numbers on the Avenue des Champs Elysees, Paris, which is the most elegant of Paris avenues, and the one most completely given over to the automobile industry. Packard has taken over the show rooms formerly occupied by Ballot; Buick has taken the place of the defunct Bellanger Co., Ford and Lincoln have opened new quarters, and Essex is being handled by an American dealer.

Mack Figures 45% Up from Last Year

NEW YORK, Nov. 5—Mack Trucks, Inc., report net profits of $2,614,205 for the third quarter of 1925, after charges. After allowing for dividends on first and second preferred stocks of $284,436, the balance equalled $6.86 a share on 339,750 shares of common. Total net income for the first nine months of the year, after charges, was $7,268,052, or $18.88 per share on the common. Net income for the first nine months of 1924 were $4,795,938, or $13.98 a share on the common.

Current assets as of Sept. 30 were $33,606,883. In a statement sent out by the company, business for the first nine months of the year was said to be 45 per cent greater than in the same period last year.

TO MAKE ELECTRIC DRILLS

GREENFIELD, MASS., Nov. 3—Goodell-Pratt Co. has bought the electrical drill division of the A. W. Way Co., of Hartford, Conn., and is transferring production to its plant here. Goodell-Pratt for years has done a large business in producing hand-power drills and will now develop the output of the electrical lines, a large percentage of which goes to the automotive industry. The drills will be made in different sizes to meet the demands of large-scale factory production as well as small establishments.

Nash Announces Price Reductions

Cuts Range Up to $300 on the Advanced and Special Six Lines

CHICAGO, Nov. 2—The Nash Motors Co. has announced price reductions ranging up to $300 on the Advanced Six and Special Six lines, which became effective yesterday. No change has been made in the Nash models themselves. E. H. McCarty, general sales manager of the company, stated that this is in effect a double reduction.

"When the new Nash models were introduced in July," said Mr. McCarty, "they presented new and original body designs, far-reaching improvements in construction, and many refinements in engineering and equipment, all of which entailed large increases in manufacturing cost. If Nash sales and production had not been smashing all records for volume at that time, we certainly should have been compelled to increase prices materially, but Nash prices were held at the same figure, and the response of the public was instantaneous. In the three months since the new cars were put on display, sales have more than equalled the sales for the whole of 1924, which was a banner year for Nash, so that it is now possible for us to make these reductions and thus pass on the earned benefits to buyers. There has been no cheapening of materials, construction or manufacturing."

The new prices and comparisons with former prices follow:

	New Prices	Old Prices
"Special Six"		
Roadster	1115	1135
5-pass. 2-door Sedan	1215	1265
5-pass. 4-door Sedan	1445	1545
No change in 5-pass. Touring.		
"Advanced Six"		
5-pass. Touring	1340	1375
7-pass. Touring	1490	1525
5-pass. Sedan	1425	1485
7-pass. Sedan	2090	2290
Victoria	1790	2090
4-door Coupe	1990	2190
No change in Roadster.		

AJAX SETS NEW DAILY RECORD

RACINE, WIS., Nov. 2—A high record of 133 Ajax cars was reached on Oct. 22. Production is, however, averaging 115 per day and this will be stepped up to 299 per day by February 1. Additional machinery to give this capacity is being installed. Ajax cars are now being delivered through upwards of 500 dealers and are also being shipped to a dozen foreign countries, such as Australia, South America, etc.

Ford Rings Reduced

BALTIMORE, Nov. 2—The American Hammered Piston Ring Co. announces that the price of the special Ford rings has been reduced to 25c. The trade is to be protected against this price decline by rebating for any rings still in stock.

Shipping Strike Hits African Car Sales

Farmers Anxious About Crop Movement and Hesitate, Therefore, to Buy

JOHANNESBURG, SOUTH AFRICA, Oct. 13 (*by mail*)—The record maize crop has just about been gathered and is being taken to the various grain elevators for the rail journey to the ports. It is unfortunate, however, that we should be in the throes of a shipping strike, and it looks as if there will be a considerable amount of trouble in getting the maize away. The farmers are anxious, and this has, to a certain extent, affected the sale of cars. However, business generally is good and the motor dealers are looking more and more to the country for new car business. The used car position remains about the same, but it is not acute. The Transvaal Automobile Club is promoting long distance reliability runs of 400 miles and more with a view to advertising the modern car in distant districts.

Most of the provinces of the Union of South Africa have decided to put a stop to road racing. The Administrator of the Transvaal has just promulgated an edict declaring illegal any competitions, whether for speed or reliability. With regard to the latter, however, permission may be obtained by application to the Administrator's office. The Transvaal Automobile Club, it is understood, favors this new law, whereas the motor cycling bodies do not.

Developments of the Week in Leading Motor Stocks

NEW YORK, Nov. 4—Directors of the Studebaker Corp., by increasing the regular dividend rate from $4.00 per share to $5.00 and declaring an extra dividend of $1.00 per share, not only gave concrete evidence of the prosperity of the industry and of the tangible benefits accruing to the stockholders of that corporation, but added fuel to the fire of the wild public speculation which has been in progress in the motor stocks. Earnings of $5.09 per share reported by the General Motors Corp. on the common stock for the third quarter, had given the cue to the speculative element of what might be expected of the motor companies. This was followed by the remarkable statement of the Chrysler Corp., showing $9.86 per share on the outstanding common stock in the third quarter, and comparing with $5.40 per share in the preceding quarter, and here was sufficient reason, in the public mind, for the indiscriminate purchase of motor securities. No one who has had any experience in public speculative markets would attempt to forecast the duration or extent of the rise which may occur under the impetus of speculative hysteria. Continued firmness in time money rates, freight movement, expanding steel activities, nor the irregularities of corporation earning statements have any weight in such a market.

It is necessary to repeat only one or two of the rumors which have been actively circulated in the week to learn something of the present public temper toward the motor stocks. One of these stories was that Charles M. Schwab is engaged in consolidating the following companies: Packard, Paige-Detroit, Hudson, Stutz, Jordan, and Pierce-Arrow. Another rumored consolidation would put together Hudson, Paige-Detroit and Dodge Bros. These rumors are manifold, some with a plausible basis and others too fantastic for consideration. Nor have price reductions announced by some of the leading manufacturers in the week dampened the ardor of speculators. Hudson again reduced its price, and Nash Motors announced reductions running to as high as $300 per car.

The tire companies, in common with most of the large motor manufacturers, are reporting curtailment of operations. Most of the factories in the Akron district are reported as operating at slightly less than 80 per cent. Yet this seasonal decline in production will not prevent most of these companies from showing very large gross sales and substantial net profits for the year. Firestone, for instance, will have gross sales exceeding $100,000,000, compared with $85,000,000 last year, and net profits of more than $10,000,000 are anticipated. Fisk Rubber sales approximated $70,000,000 with net profits of about $8,000,000. U. S. Rubber probably will show both gross and net to have been the best since 1920. B. F. Goodrich Co. reported, in the September quarter alone, earnings sufficient to pay the full year's common dividend, an unusually good showing.

There is no question of the very satisfactory year which the automotive industry has enjoyed. Whether or not present prices of the stocks of companies identified with the industry have not fully discounted present prosperity and the future, so far as can be seen, is for the individual to determine. In a few cases higher prices seem to be justified, but these are few.—H. H. S.

Studebaker to Pay $1 Extra Dividend

Chrysler, Studebaker, Willys-Overland Statements Reflect Prosperity of the Industry

NEW YORK, Nov. 2—Chrysler, Studebaker and Willys-Overland have just issued statements for the third quarter of 1925 reflecting the prosperity evident in many parts of the automotive world.

Studebaker Corp. of America and subsidiaries, for the quarter ended Sept. 30, reports net profits of $5,035,177, after interest, depreciation and income taxes, equal, after preferred dividends, to $2.61 per share on 1,875,000 no par common, compared with $2,131,409, or $1.06, in the third quarter last year. Net income for the first nine months this year was $15,157,226, or $7.85 per share, against $9,703,678, or $4.94 in the same period of 1924. Net working capital as of Sept. 30 was $32,698,728. In the nine months 111,545 cars were sold against 76,508 in the 1924 period and total surplus increased from $28,-164,412 to $39,309,604. The corporation has declared an extra dividend of $1 per share, and a quarterly dividend of $1.25, placing the common on a $5 annual basis, as compared with $4 previously. The regular quarterly dividend of 75c on preferred was also declared. All dividends are payable Dec. 1 to stock of record of Nov. 10.

Chrysler's Large Profits

Chrysler Corp. and subsidiaries, for the third quarter of 1925, report net profit of $8,078,186, after interest and depreciation, but before Federal taxes, equal, after estimated Federal taxes and 8 per cent preferred Series A dividends, to $9.86 per share on 677,910 outstanding common no par. This compares with $4,689,000 in the preceding quarter or $5.40 per share on the present share basis. In the third quarter last year, Maxwell Corp., the predecessor company, reported net profit of $1,831,658, or $1.72 per share. Chrysler Corp. net income for the first nine months this year was $16,275,286, or $19.07 per share, against $2,296,094, or $1.06, on the same share basis in the corresponding period last year. Sales for the first nine months of 1925 were 180 per cent of the sales for the same period of 1924. Net current assets are $29,408,-276, compared with $14,647,740 last year and surplus as of Sept. 30 was $11,389,185 against $6,070,667 as of June 25, 1925. The corporation has declared regular quarterly dividend of $2 on preferred, payable Jan. 2, to stock of record Dec. 15.

Overland's Great Gain

Willys-Overland Co. and subsidiaries report net profit of $3,183,299 for the third quarter this year, after ordinary taxes, depreciation, interest and charges for development of new models, but before Federal taxes. This was equal to $14.43 per share on $22,049,500 7 per cent preferred and, after allowing for regular preferred dividends, to $1.23 on 2,264,644 shares of $5 par common, against $7,328,000 or $33.24 on preferred and $3.06 on common in the preceding quarter and 13 cents a share on preferred in the third quarter last year. Net profit for the first nine months of 1925 approximated $13,638,881 before Federal taxes, equal to $61.85 per share on preferred and $5.51 on common, against $2,811,134 or $12.74 on preferred and 73 cents on common in the same period of 1924.

Pierce-Arrow Shows Business Increase

BUFFALO, Nov. 3—Pierce-Arrow Motor Car Co. for the quarter ended September 30, 1925, reports net income of $405,777, after interest, depreciation and Federal taxes, equivalent, after regular $8 dividend requirements on the prior preference stock and 8 per cent preferred stock, to 69 cents a share earned on 250,000 shares of no par common stock. This compares with $364,714, or 53 cents a share, on common in the preceding quarter, and $137,281, or $1.05 a share on preferred stock in the third quarter of 1924.

Net income for the first nine months of 1925 was $970,908, equal to $1.10 a share on common, against $354,154, or $2.59 a share on preferred stock, after allowing for prior preference dividends in first nine months of previous year.

Income account for quarter ended September 30, 1925, compares as follows:

	1925	1924
*Oper. inc.	$559,732	$251,478
Int. Fed. tax, etc.	153,955	114,197
Net inc.	$405,777	$137,281

Income account for nine months ended September 30, 1925, compares as follows:

	1925	1924
*Oper. inc.	$1,450,605	$707,318
Int. Fed. tax, etc.	479,697	353,164
Net inc.	$970,908	$354,154

*After depreciation.

Toledo May Get New Body Plant

TOLEDO, Nov. 3—A large body plant may be built soon in Toledo as a result of the movement in the industry through which several of the independent builders are being absorbed by large automobile manufacturing companies.

It is believed the added production of the Willys-Overland Co., a large percentage of which is in closed models, and the sale of the American Body Plant at Detroit to Chrysler Motor Co., will eventually mean the building of a body plant here. Some of the other companies furnishing bodies to the Willys-Overland Co. under contract are also understood to be the subject of negotiations by well known manufacturers.

FINANCIAL NOTES

Hayes Wheel Co.—This company has decided to retire outstanding $570,100 first mortgage bonds, thus eliminating funded debt. Third quarter net profits were $373,625, or $1.72 per common share, against $656,735, or $3.17, in the preceding quarter, and $123,115, or 44 cents, in the third quarter last year. Net profits for the first nine months this year were $1,254,003, or $5,83 per common share, after preferred dividends, compared with $539,345, or $2.44, in the first nine months last year.

Mullins Body Corp.—This corporation's net profits for the third quarter were $81,556, before Federal taxes, or 63 cents per common share, after preferred dividends, against 25 cents in the preceding quarter. Net profits for the first nine months of 1925 were $273,000, or $2.15 per share, compared with $251,000, or $1.93, in the same period of 1924. Earnings for the full year 1925 are estimated at $350,000 or $2.50 per share against $302,797 or $2.25 last year.

Spicer Manufacturing Corp.—The corporation announces consolidated net profit of $535,718 in the third quarter, equal to $1.30 per share on common, compared with $649,-185, or $1.61, in the preceding quarter and $193,397, or 35 cents, in the third quarter last year. For the first nine months this year, net profits were $1,501,887, or $3.61 per share, against $897,040, or $1.92, in the first nine months of 1924.

Jordan Motor Car Co., Inc.—This company reports net income of $139,459 for the quarter ended Sept. 30, which, after preferred dividends, equalled 94 cents a share on 126,000 shares of common, compared with net of $177,773, or $1.24 per share, in the same quarter of 1924. For the nine months ended Sept. 30, net income, before Federal taxes was $573,172, or $4.06 per share, compared with $658,444 or $4.74 per share in the first nine months last year.

Hupp Motor Car Corp.—This company, for the quarter ended Sept. 30, showed $598,026 net profit, after Federal taxes, etc., equal to 65 cents a share on $9,138,090 par $10 common outstanding, against $1,284,757 or $1.40 per share in the preceding quarter, and $492,136 or 53 cents in the corresponding quarter of 1924. Net profit for first nine months this year was $2,735,746 after taxes, etc., or $2.90 per share compared with $1,182,342 or $1.29 in the same period last year.

Eaton Axle & Spring Co.—The consolidated balance sheet as of Sept. 30 shows current assets, $3,132,287; current liabilities, $748,823, and net working capital, $2,383,464; against $1,944,001, as of Dec. 31, 1924.

New York Stock Exchange has admitted 20,500 additional no par common shares of this company.

Republic Motor Truck Co.—Gross sales for first eight months this year were $2,255,597, against $2,624,416 for full year of 1924, with net profits, $147,069, or $1.47 per common share; net current assets, $1,905,990; and current liabilities, $602,380. Earnings for full year are estimated at about $2.50 on 100,000 common outstanding.

American Bosch Magneto Corp.—New York Stock Exchange has admitted to its list 69,133 additional no par shares of this concern.

Program of Second Annual N.S.P.A. Meet

Every Recognized Line of Replacement Parts to be Exhibited at Show

CHICAGO, Nov. 2—The following is the announced program of the second annual National Standard Parts Association convention, which will be held here Nov. 16-18:

Monday, November 16

A. M.—Registration and attendance at exhibition.

2-5 P. M.—First session. Delegates, alternates, visitors and press.

Evening—Nothing scheduled.

Tuesday, November 17

9-12 A. M.—Second session. Delegates, alternates and press. No visitors.

2-5 P. M.—Third session. Divisional meeting, manufacturers and jobbers separate.

Evening—Attendance at show.

Wednesday, November 18

9-12 A. M.—Fourth session. Delegates, alternates and press. No visitors. Business.

2-5 P. M.—Attendance at show.

Evening at 7 P. M. Banquet at show.

There are 8000 square feet of space in the exhibition hall and room for upwards of 90 booths, 93 at the most. Only 6 or 7 spaces are left. Every recognized line of replacement parts will be represented.

Names of speakers will be announced later.

Budd Co. to Enter Additional Field

PHILADELPHIA, Nov. 3—The Edward G. Budd Manufacturing Co. is entering a new field. On the same plot with their steel wheel plant in Detroit, an assembly station for the one-piece all-steel body is rapidly nearing completion.

The new facilities provide for complete finishing of the bodies, a task hitherto left to the car manufacturers. The units will be shipped in "the white" from the main factory in Philadelphia, thereby taking advantage of the low production costs, and will be assembled to the last minute detail at Detroit, ready to drop into place on the chassis.

Ready in December

Begun early in September, the new plant, a $2,200,000 structure, will be ready for production early in December.

The finishing and trimming of the bodies is greatly facilitated by the all-steel nature of their construction. Once they are welded and painted, a battery of ten 600-hp. ovens will give the finishing bake. The upholstery comes fastened to metal frames, which are easily screwed to the body and as easily removed. The new plant will also be prepared to install the glass and hardware.

The Budd Co. believes that transportation difficulties will be greatly reduced by this new station. Not only will the manufacture of the units in the East cut costs, but delivery by truck of the finished bodies from the Detroit plant to nearby customers is also believed to be more economical.

The plant is a four-story structure, 725 by 100 ft. covering 290,000 sq. ft. It is located on the same plot with the Budd Wheel Factory. Power will be derived from 1,000 hp. addition to the wheel plant power house.

LUXURIOUS PARIS HOME OF CHRYSLER

PARIS, Oct. 24 (*by mail*)—The new Chrysler home here, which has just been opened, claims to be the largest and most luxurious automobile sales headquarters in the world. It cost $300,000, has a floor area of 26,500 sq. ft., and galleries and upper floors with an area of 40,000 sq. ft.

Buick to Operate on Capacity Basis

FLINT, Nov. 2—Buick will continue to operate on a capacity basis in December, the month that is set aside for the annual inventory. Harry H. Bassett, president and general manager, said today. The same rule will apply for January and February, it was said. This is being done to care for the unusual demand for the car.

The decision to continue to operate at full capacity was made after a survey by the sales department during which dealers were queried as to the sales in their territory in December, January and February.

Airplane Maker to Enter Radio Field

CLEVELAND, Nov. 3 — Extensive manufacture of radio equipment soon is to be begun by the Glenn L. Martin Co., airplane makers here.

Announcement to this effect was made today by Mr. Martin, president of the company, who pointed out that the manufacture of "B" battery eliminators for radios already had started.

Concerning the airplane business at present, Mr. Martin took occasion to point out that there are more than $1,000,000 in unfilled orders on the company's books at the moment, and that the outlook for the future is brighter than ever before in the company's history.

Service Corporation May Build Own Buses

New Jersey Body Assembling Unit Which May Replace Fleet of 900

NEW YORK, Nov. 4—The New Jersey Public Service Corp. is manufacturing a bus of its own design, which, if successful, will eventually supplant the fleet of over 900 buses now operated by the corporation in New Jersey.

This venture was instigated by the fact that maintenance of the fifty-eight makes of buses which the corporation has had in operation at various times has developed a shop personnel quite able to assemble complete buses and that it already has a well-equipped body building plant. The corporation believes that a bus chassis assembled from standard units in its own shops, at Irvington, near Newark, would not only be cheaper than any that could be bought, but also by designing the chassis in the light of the organization's operating experience it might be possible to produce a unit specially suited for the operating and maintenance requirements of its city bus service.

Even if the new bus does not prove satisfactory enough to adopt as standard the company expects to obtain considerable information through its use which will be of great value to bus manufacturers in helping them to design their products to meet service requirements. The experimental bus has a Buda type bus engine, Fuller clutch and transmission, two Spicer propeller shafts, Huck rear axle and Duplex speed governor.

New Oakland Has Six-Cylinder Engine

PONTIAC, MICH., Nov. 5—The new General Motors car to be produced by the Oakland Motor Car Co. as an addition to the line and a companion to the Oakland Six, also will have a six-cylinder engine. For several months, the new car has been undergoing tests at the Milford proving grounds and now it is stated that over $3,000,000 is being invested in new equipment not only to prepare for the production of the new model but also to expand the output of the Oakland.

Patent Suit Decision

CHICAGO, Nov. 2—The appeal of the Stromberg Motor Devices Co. in their suit against the Beneke Manufacturing Co., makers of the Rayfield Carbureter, involving the Anderson and Goldberg patents, was denied by the United States Circuit Court of Appeal for the 7th District, sitting in Chicago October 19. This decision sustained a previous decision made by Judge Wilkerson in the United States District Court in 1923.

Car Financing Plan Started in Germany

American Firm Offers Liberal Terms to Dealers—Frowned on by Government

WASHINGTON, Nov. 4—The automotive division of the Department of Commerce here is advised, through consular dispatches from Germany, that an American firm there has recently introduced a system of financing their dealers and are giving liberal terms with interest as low as 5½ per cent.

"This," says the dispatches, "has caused a great many dealers to endeavor to discontinue handling other makes and close contracts with this firm. Since this was introduced, a decision of the German customs authorities has stopped dealers holding their cars in bond and withdrawing them on paying import duties except as sold.

"According to the new ruling all imported automobiles must be withdrawn from custom houses and import duties paid within a month from date of arrival in Germany. This is going to put greater financial pressure upon dealers and cause them to cut down the size of their consignment stocks. Incidentally, this Government move is in line with the policy recently pursued in making more difficult the importation of luxury and semi-luxury goods. Only a month ago the Reichsbank decided to reduce the amount of credits for dealers importing foreign automobiles. Under these circumstances, other American companies would be wise if they promptly inaugurated some sort of an automobile financing system."

Radio to Obviate Language Troubles

NEW YORK, Nov. 2—Nearly a score of languages are expected to be represented by the delegates to the second World Motor Transport Congress to be held at Grand Central Palace January 9-16. At the first congress in Detroit, many foreign delegates were at a distinct disadvantage because English was the language of the sessions. This difficulty will be obviated here.

Translators in booths adjoining the assembly room will receive the speeches in English through microphones and relay them in various languages through ear phones provided for all delegates not speaking English. Each delegate may choose the phones delivering the translation in his own language. This is expected to do away with the delays caused by translation in the usual manner at the first Congress.

Houde Engineering Builds Plant Unit

BUFFALO, N. Y., Nov. 3—A. B. Shultz, president of the Houde Engineering Corp., announces that construction began on November 2 on a new unit of the plant here. It will be one story, 50 by 130 feet in size, concrete, brick and glass. Seventy-five per cent of the outside walls will be of glass. It is expected to have it complete in six weeks.

When completed the new building will be used for the production of the company's leather goods, including Scully spring protectors and boots.

Mr. Shultz states that the plant at present is operating at 85 per cent of capacity, while the normal production for this season of the year is 50 per cent of capacity. During September and October, he states, the line of the company has produced a business 150 per cent better than a year ago and that it has 300 per cent more orders on hand than one year ago.

PLAN FOR PAIGE AND JEWETT NEW MODELS

DETROIT, Nov. 3 — Development work on the new addition to the Paige and Jewett lines which is to be announced at about the time of the New York Show has been completed and at present some revisions are being made in the facilities at the West Warren plant to accommodate the production of the new job. Although all machine shop equipment and assembly are concentrated at this plant, no new buildings are required for the increased production schedule which will be brought about by the addition of a third member to the lines already established.

According to officials of the Paige-Detroit Motor Car Co., the new smaller 6-cylinder car which is as yet unnamed will incorporate features of acceleration and braking ability which conform to the driving practice growing out of the increased congestion of traffic on hard highways and the block system of traffic control. In addition to these and a number of other mechanical refinements, closed bodies which are to comprise the entire production will be extremely roomy with an unusual freedom of vision.

U. S. Surfaced Roads at 500,000-Mile Mark

WASHINGTON, Nov. 4—The mileage of surfaced roads in the United States is nearing the 500,000-mile mark, says the Bureau of Public Roads of the U. S. Department of Agriculture.

Some weeks ago, the State reports indicated that there were 128,347 miles of surfaced road on the State systems at the end of 1924, and similar subsequent reports from other States indicated that mileage of surfaced country roads was 339,558, making a total of 467,905 miles. While it is probable that the estimate of county roads is not as accurate as that of State roads, the total is probably not too large.

Ford Denies Buying Hudson Motors

Recent Purchase of Shares Said to Be Purely for Investment Purposes

NEW YORK, Nov. 3—The recent rumor that Henry Ford had acquired the Hudson Motor Car Co., denied by Edsel Ford, probably was caused by the fact that the latter has been purchasing for cash several thousand shares of Hudson stock in the open market and transferring these shares, it is said, to his wife's name. It is understood that his outright buying for investment has made the Ford interest the largest outside interest in Hudson. The inside holders are R. B. Jackson, son-in-law of the founder of the concern, and W. J. McAneeny, operating vice-president, Mr. Jackson also representing the Hudson interests.

Company officials and insiders say that the stockholders are disregarding the wide fluctuations of the stock and are determined that control shall not be relinquished by them. Edsel Ford is said to have bought 7,000 more shares last Friday at from 106½ to 114. Yesterday the stock sold up from the previous day's low of 117¼ to 139½ and then declined to 130 or a gain of 13 points for the day. It is understood that insiders last September were offered 90 per share when the market price was 62.

Organize Concern to Make Bakelite Parts

CHICAGO, Nov. 2—Backed by officers of the Imperial Brass Manufacturing Co., the Imperial Molded Products Corp. has been organized to manufacture Bakelite products, including parts for the automotive industry.

A large modern factory has been taken over and equipped with new machinery for the moulding of bakelite products by high-pressure steam. Production will start at once.

Officers are: Paul Tietz, president, formerly with the H. G. Saal Co., Bakelite moulders; James T. Greenlee, secretary, for several years manager of the automotive parts division of the Imperial Brass Manufacturing Co.; Frank McNellis, treasurer. McNellis is also president of the Imperial concern.

Named Sales Manager

NEW YORK, Nov. 3—Maas & Sonneborn, Inc., 611 Fisk Bldg., New York, have recently been appointed export sales manager for U. S. Air Compressor Co., Cleveland; Sterling Equipment Mfg. Co., Cincinnati; Clear Vision Pump Co., Wichita, and Duraflex Metal Hose Co., Buffalo. Maas & Sonneborn, Inc., act in the capacity of export sales manager for a limited number of non-competitive automotive equipment lines.

Men of the Industry and What They Are Doing

Crowley on Technical Staff

Guy F. Crowley, formerly in the development department of the Firestone Tire and Rubber Co., has joined the technical staff of the American Chain Co., Inc., Bridgeport, Conn., as sales engineer of the tire bead wire division. Mr. Crowley was associated for several years with the U. S. Tire Co., Hartford plant, as chief draftsman and with the Fish Rubber Co., Chicopee Falls, Mass., as assistant chief engineer. In his new connection he handles the special wire structure known as flat-tape, for use in construction of straight side tire beads, which the American Chain Co. is introducing.

Eldridge Assistant Manager

After an absence of five years in Chicago, during which time he was manager of the Chicago branch of the Reo Motor Car Co., Clarence E. Eldridge is returning to the home plant of the company in Lansing, Mich., in the capacity of assistant manager of the company's sales division.

Mr. Eldridge succeeds C. A. Triphagen who became sales manager, following the resignation of R. E. Rueschaw. L. B. McEwing, who has been actively associated with the Chicago branch for the last five years, has been named to succeed Mr. Eldridge.

Willys Goes to Memphis

John N. Willys, president of the Willys-Overland Co., is expected in Memphis in November to inspect conditions relative to establishing a central point for shipments of hardwood to the company's principal plant in Toledo, Ohio. Memphis has been recommended by some of the officials as a concentrating point for lumber used in making bodies and wheels for the Willys cars and a dry kiln system for preparing green lumber has been suggested.

Myers on the Coast

Henry T. Myers, sales manager for the Chrysler Corp. was the guest of honor, late in October, at a dinner given in Oakland, Calif., by Chrysler distributors and dealers from all parts of Central and Northern California. Harold D. Knudsen, Chrysler distributor in Oakland, presided at the dinner. Myers is on an inspection trip of the coast and is holding sales meetings for Chrysler dealers in Washington, Oregon and California.

Cross Promoted

F. M. Cross, formerly manager of the New York pneumatic tool department of the Ingersoll-Rand Co., has been appointed manager of the similar department for the Chicago territory with headquarters in Chicago.

Mook Addresses Dealers

Harry G. Mook, sales manager of the Hudson Motor Car Co. of Detroit, was in St. Louis last week on a visit to the Hudson-Frampton Motor Car Co., St. Louis distributors for Hudson and Essex cars. He addressed a meeting of the dealers and salesmen in the district. Mr. Mook came here from a trip through the South, where, he said, he found business conditions unusually good.

Crittenden Home From Abroad

George A. Crittenden, sales manager of the Lovejoy Manufacturing Co., has just returned from France, where he went to compete in the test arranged by the French Government to determine the results of vibration caused by motor vehicles on the foundation of buildings. He had entered a Marmon car equipped with Lovejoy Shock Absorbers, but the test was postponed until November and he was not able to remain for it.

Mr. Crittenden said that he found conditions abroad very good in the motor field and believed that America would take to the smaller cars because they were real machines and in no sense anything like the old cycle cars.

Coffin Vice-President

Howard A. Coffin, of the Cadillac Motor Car Co., has been appointed vice-president in charge of sales of the White Star Refining Co., it was announced by H. B. Earhart, president of the organization. Mr. Coffin will assume his duties immediately.

Sommerville Succeeds Hopkins

R. W. Sommerville has been appointed Canadian sales manager of the Black and Decker Mfg. Co., Ltd., succeeding W. J. Hopkins, who resigned to go South. Mr. Sommerville has been for a considerable period of time associated with the company as their Ontario and Western sales representative.

Lecture on Engineering

Several representatives of the automotive industry are among the lecturers who will augment the twenty-one professional, short-period, advanced courses offered by the Division of Highway Engineering and Highway Transport of the University of Michigan this year. They include: Roy D. Chapin, Hudson Motor Car Co.; Edward F. Loomis, secretary, National motor truck committee, National Automobile Chamber of Commerce; Alfred E. Masury, vice-president and chief engineer, and T. C. Walden, district manager, motor bus department, International Motor Co.; and Carl Parker, manager of sales, bus and taxicab department, Reo Motor Car Co.

Russell Motors Officials

Appointment of A. E. Ames as vice-president and J. W. Gibson as a director has just been announced by Russell Motor Car Co., Ltd., Toronto, Ont., in issuing the annual report for the year ending July 31, 1925. Mr. Ames succeeds to the office of vice-president formerly occupied by T. A. Russell who was recently appointed president. Mr. Gibson is general manager and a director of Canada Cycle and Motor Co. The Russell Motor Car Co. subsidiaries now include: Canada Cycle and Motor Co., Ltd., Canadian Acme Screw and Gear, Ltd., and Willys-Overland, Ltd.

Porter Goes to Wilmington

John F. Porter, for the last three and a half years treasurer and director of the Peerless Motor Car Co., Cleveland, has resigned effective November 1, it has just been announced.

Mr. Porter goes to Wilmington, Del., to be associated with John J. Raskob, chairman of the finance committee of the General Motors Co. and vice-president of the du Pont Co.

Stettinius Made Chairman

William C. Stettinius, president and general manager, American Hammered Piston Ring Co., Baltimore, Md., has been elected chairman of the replacement parts committee of the Automotive Equipment Association, succeeding Malcolm McCormick, of Milwaukee Motor Products, Inc.

Underhill Made Manager

Geo. S. Underhill, of Toronto, Ont., has been appointed manager of the general parts and service division, Durant Motors of Canada, to succeed Joseph Dick, recently promoted to an executive position at Flint, Mich.

Smith Named Manager

Lon R. Smith, for years identified with selling in the industry by his connection with Buda, Midwest, Columbia, etc., has become manager of the merchandise department, Homer McKee Co. advertising agency, Indianapolis, Ind.

Stevens Joins Olds

Herbert C. M. Stevens has been added to the staff of the Olds Motor Works, I. J. Reuter, president and general manager, has announced. Mr. Stevens was formerly chief engineer of the Sunbeam Motor Co. in England.

Gorrell a Director

Edgar S. Gorrell, recently elected vice-president, has now been chosen as a director of the Stutz Motor Car Co. of America, Inc.

Survey Shows Automotive Sales Above Average for Fall Season

(Continued from page 794)

volume of business materially above the same season a year ago.

Sectional reports follow:

New England

Sales of both new and used cars are falling off. However, the dealers are not at all discouraged. Some of them have sold on an average of 25 per cent more new cars and 20 to 40 per cent more used cars than they did for the same period of 1924, and, with two more months ahead, they are confident that they will have a very good year's business. Accessory and tire men say that they have had a good Summer and Fall season and they are living in hopes that there will be no great slump for the Winter.

Middle Atlantic

Conditions are somewhat spotty. Buffalo, for instance, reports generally good business, despite something of an increase in used car stocks. Rochester, on the other hand, finds that an appreciable slump has set in. Throughout Pennsylvania, sales are equal to or better than the September level. Accessory sales continue strong, with, however, a seasonal shifting from touring equipment to such lines as robes and radiator covers.

New car sales in Baltimore during October showed a marked increase over those in September. General business conditions in the Baltimore territory are good. Improved conditions also have reached the rural sections. Good crops brought considerable money to most of the farmers and many of them have invested in cars.

Southern

Sales in several important sections showed increases, with the only weak point, apparently, being in South Carolina, where crops have not been entirely satisfactory. Sales in that State fell sharply below the September level. North Carolina, however, did a fair business, approximately on a par with the former month and the total would have been higher if dealers in two or three important lines had been able to obtain sufficient deliveries. From Louisville comes the word that October sales were slightly less than September, but no more than is normal for the season. October records show a material increase over the same month last year and dealers are confident of a continuation of the trend during the remainder of 1925. General business conditions are excellent. Used car sales have slowed up, but this is held to be due largely to the more rigorous policy being followed by merchants on trade-ins, and the market is considered fairly satisfactory.

Georgia, Alabama and Tennessee all submit favorable reports. The most active State in the South is Florida, as it has been for months, and dealers there are naturally looking for a big increase in business when the annual pilgrimage of tourists begins.

Central

In this region, good business was done during October. Iowa was an exception, this being blamed on wet and otherwise disagreeable weather. New car registrations, it is said, will probably be considerably below those of the same month for last year. Used car sales there have slumped, but stocks are not reported as excessive.

Toledo reports that there was a tendency to slump during the early days of the month, but that the market quickened toward the end. Tire sales here, as in most representative centers, have felt the reaction of the recent price cuts, which were immediately preceded by a flurry of buying. Employment remains above normal and farming conditions are better than for several years.

Prosperity in all sections of the automotive industry is to be found in Cleveland. November, car makers say, will probably witness a seasonal reduction in output, but they predict factory activity of greater proportions than ever to come about the first of the year. From Cincinnati comes the report that October deliveries as registered in Hamilton County reached a total of 2,064 new cars, as compared with 1,810 in September.

Middle West

In this section, declines and advances approximately offset each other. St. Louis reports that new car sales are tapering off to the usual Fall basis, but dealers are satisfied with the volume of business they are doing and say it is good for this time of the year. Although used car sales have slackened, stocks have not grown to any appreciable extent because, in some lines, dealers are still behind on new car deliveries. In Minneapolis, approximately the same trend is noted, though probably accentuated a bit by the seasonably cold weather.

Slight recessions are reported in the Milwaukee territory, but sales are far ahead of the corresponding period last year. Parts makers report that production is establishing a new high record for the Fall season. Conditions are particularly good in the Indianapolis district and there is a belief that the final check-up will show October sales actually ahead of September.

Southwest

In Texas sales during October about equaled September, with deliveries better. Used car stocks are increasing. The rural districts appear to be especially favorable markets just now. In Louisiana and Mississippi, car distributors and automotive jobbers are doing a little better business than in September. Cotton has been rapidly harvested and the demand by pickers for used cars has helped to keep down stocks.

Mountain

In the Northern part of this region business has been holding up at approximately the September level, and the future is faced with considerable optimism as heavy sales to farmers are expected as a result of the excellent crops, which are selling at high prices. In practically all parts of Colorado there has been an improvement in business, with October showing a heavy increase in sales over the corresponding period of 1924.

Pacific

Sales of passenger cars, trucks and used cars in Central and Northern California for October showed a gain over those for September estimated at about 20 per cent, and over those of October last year at nearly 30 per cent. Good rains materially stimulated rural buying, the demand for trucks from fruit growers being particularly gratifying. Substantially the same situation is revealed in Los Angeles territory, which, however, has to report about finance conditions:

"The two-year payment plan is now being featured by nearly all Los Angeles distributors, and the new low down-payments and the long terms are causing a slowing up of used car sales. Dealers who feature guaranteed, reconditioned, used cars, however, declare that they are still having a satisfactory turnover. Although the outlook for new car sales is viewed as entirely satisfactory, Los Angeles distributors admit that used cars are likely to present a serious merchandising problem this winter in Southern California."

In the Northern Pacific States, excellent crop conditions resulted in October gains in some sections over September.

Austin Co. Expands

OAKLAND, CAL., Nov. 3—The Austin Co. of California has been awarded the contract for the construction of a new all-daylight, steel, brick, concrete and glass building at Emeryville, to house the plant of Hubbard & Co., manufacturers of automobile tools, bolts, screws and similar manufacturing materials. The buildings will occupy an area of 205 x 170 feet and will cost a minimum of $250,000, according to announcement made here by Hubbard & Co. The present Hubbard plant now occupies six acres.

Coming Events

SHOWS

Oct. 18-31 — Saloniki, Greece, First International Sample Fair.

Oct. 29-Nov. 7—London, Annual Truck Show.

Nov. 9-14—Chicago, A. E. A. Show, Coliseum.

Nov. 15-21 — New York, Automobile Salon.

Nov. 16-18—Chicago, Products Show, National Standard Parts Association.

Nov. 16-21—Detroit, First National Motor Bus Show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

Dec. 7-20 — Buenos Aires, 8th Annual Argentine Automobile Show.

Jan. 9-16—New York, N.A.C.C. National Annual Show, Grand Central Palace.

Jan. 18-23—New York, Twelfth National Motorcycle, Bicycle and Accessory Show, New Madison Square Garden.

Jan. 30-Feb. 6 — Chicago N.A.C.C. National Annual Show, Coliseum.

Jan. 30-Feb. 6—Chicago, Automobile Salon, Hotel Drake.

CONVENTIONS

Nov. 5—Drake Hotel, Chicago, General Fall Meeting, Automotive Lighting Association.

Nov. 9-10—Chicago, Hotel La Salle, N.A.C.C. and S.A.E. Joint Service Meeting.

Nov. 9-14—Chicago, Automotive Equipment Association.

Nov. 10-11—Washington, Motor Truck Industries, Inc.

Nov. 16-18—Chicago, National Standard Parts Association.

Nov. 16-21—Detroit, Society of Motor Transportation Engineers.

Nov. 17-18 — Detroit, Michigan Bus Owners Association.

Nov. 17-18 — Chicago, National Association of Finance Companies.

Nov. 17-19—St. Louis, National Tire Dealers Association.

Nov. 18-21—Detroit, American Association of State Highway Officials.

Jan. 9-16—New York, Second World Motor Transport Congress, Grand Central Palace.

Jan. 21-22—Hotel Statler, Buffalo, N. Y., Winter Sectional Meeting, American Society for Steel Treating.

RACES

Nov. 11—Charlotte, N. C.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Nov. 9-10—Chicago, Hotel La Salle. Joint Service Meeting with N.A.C.C.

Nov. 12—Indianapolis, Hotel Severin.

Nov. 13-14—Philadelphia, Automotive Transportation meeting.

Nov. 17—Buffalo, Statler Hotel; Dinner, 6.30 p. m.; Meeting, 8 p. m.

Nov. 19—Cleveland.

Nov. 20 — Washington, D. C., Cosmos Club.

Nov. 20—Chicago.

Nov. 24—San Francisco, Engineers Club.

Dec. 10—Indianapolis.

Jan. 14 — New York, Annual Dinner, Hotel Astor.

Jan. 26-29 — Detroit, Annual Meeting.

Coming Feature Issues of Chilton Class Journal Publications

January 1—Automobile Trade Journal —National Shows Number.
January 7—Motor Age — National Shows Number.
January 14—Motor World Wholesale—New York Show Report.
February 4—Motor Age — Chicago Show Number.
February 4—Motor World Wholesale —Chicago Show Report.
February 18—Automotive Industries—Statistical Issue.

Motor Bus Show Entries Increase

Fifteen Additional Applications Bring Total to Forty-six Companies Exhibiting

DETROIT, Nov. 2—With the applications of fifteen additional firms for space, the number of firms that will exhibit at the First National Motor Bus Show, to be held here November 16 to 21 inclusive, has been increased to 46. This does not include those firms which have made tentative reservations.

The firms which made application last week, according to C. E. Stone, chairman of the executive committee, are: E. I. duPont deNemours & Co., Kysor Heater Co., Electric Service Supply Co., Gabriel Snubber Sales and Service Co., Eisemann Magneto Corp., United States Recording Instrument Co., Brown-Lipe Gear Co., C. G. Spring and Bumper Co., Miller Rubber Co., National Pneumatic Co., Willis Storage Battery Co., Yellow Truck and Coach Manufacturing Co., Fageol Co., Ruggles Motor Truck Co., and the Chevrolet Motor Co.

An additional feature will be the exhibition of a Stout all-metal monoplane by the Ford Motor Co. The ship is the second to be manufactured by the Stout metal airplane division of the company.

Mr. Stone said it is likely that late comers will not be able to secure showroom.

New Argrip Lines

GLENS FALLS, N. Y., Nov. 3 — Arrow Grip Manufacturing Co., Inc., manufacturer of non-skid chains for motor vehicles, is now producing a line of regular type Argrip chains without the special patented cross chain fasteners which distinguish this concern's special type chains, which are now in their third market season. Argrip chains for balloon tires are also offered with ordinary cross chain hooks in place of the special cross chain fasteners. A line of Argrip pneumatic truck tire chains has also been added.

Onthank to Address A.M.A. Gathering

CHICAGO, Nov. 3—According to a preliminary announcement just made by the Automotive Manufacturers Association, regarding the annual dinner of the association, to be held here at the Auditorium Hotel on Nov. 10, the principal speaker of the evening will be A. H. Onthank, chief, domestic commerce division, United States Department of Commerce, who will talk on the best merchandizing practices, as disclosed through intensive studies by his division of the department.

Rubber Company Plans Expansion of Plant

AKRON, Oct. 31—Officials of the Marathon Rubber Co. are preparing to install additional machinery which will increase capacity of the plant to 25,000 automobile tires a month, compared with the present schedule of 15,000 tires monthly.

"We began production at capacity when the factory started up nearly a year ago under new management," says President C. C. Osmun. "Since that time we have been behind with our orders constantly, and it is imperative to enlarge our facilities."

New England Section of S.A.E. Meets

Papers Read on Automotive Fuel—Attendance Good—Committeemen Named

BOSTON, Nov. 3—The New England section of the S. A. E. started its Winter program with a meeting last week which brought out a good attendance. The papers dealt with automotive fuel, and as a preface to the evening meeting, a group of members made a visit in the afternoon to the Beacon Oil Co. at Everett, where they were given an opportunity to go through the plant.

There was a dinner in the evening at the Engineers Club, after which the business meeting was called to order by Chairman M. R. Wolfard. L. J. Walsh, assistant general manager, Beacon Oil Co., was the first speaker. His topic was "Motor Fuel." The other paper was by R. J. Lybeck, chemical engineer of the same company. His subject was "Cracking of Oil for Fuel." Both speakers answered questions following the papers.

The committee chairmen selected for the Winter comprise Harry Eisner, meetings and entertainments; Victor Ogilvie, membership and hospitality; C. A. Chayne, speakers; Edward P. Warner, publications.

Olympia Show Attendance

LONDON, Oct. 24 *(by mail)*—The attendance of paying visitors to the Olympia Passenger Car Show this year, officially announced, shows a considerable increase over 1923. The attendance this year totaled 194,047, as compared with 180,576 last year.

AUTOMOTIVE INDUSTRIES

VOLUME 53 *Philadelphia, Thursday, November 12, 1925* NUMBER 20

Telling the Public What It Costs

Automobile Industry is Striking New Note in Instalment Selling

Instead of covering up the finance charge, every effort is being made to bring all details out in the open. Movement of great significance

By Norman G. Shidle

SEVERAL important car manufacturers have started out to show prospective customers clearly and simply how much it costs to buy their cars on an instalment basis.

A recent Chevrolet newspaper advertisement, for example, shows in tabular form the F. O. B. price, the cash delivered price in the city where the advertisement appeared, the 12 months time price and the down payment required. Appended to the tabulation is the note: "The twelve months time price includes fire and theft insurance for one year. *To get the amount charged for financing and insurance, subtract 'cash' price from 'twelve months' price.*"

Some six or seven other car builders are basing their handling of time sales advertising on the same fundamental which may be stated something like this: "The cost of buying on time should be reduced to a minimum and the prospect should be shown frankly how much he must pay for the financial assistance extended to him."

To the casual observer this may seem like no more than ordinary business honesty and common-sense.

But it is really a movement of very great significance. Scarcely anything like it ever has been heard of before in the annals of instalment selling! Think it over for a moment.

Cost Has Been Concealed

Practically all instalment plans have been sold to the public in such a way as to keep the mind of the prospect off of the financing charge. The instalment furniture houses, which were among the first to utilize this method of selling extensively, always emphasized in their advertising the very small cash payment necessary to enable the prospect to take the article home. Every effort was made to give the prospect the impression that the article which he bought on time was just as good an article as he could buy for cash for the same given total of payment. All the sales approaches were designed to keep out of the prospect's mind any idea that he was actually paying out money for the credit being extended to him as well as for the article itself. A recent real estate advertisement reads "Buy these houses with low down payment. *No charge for financing balance.*"

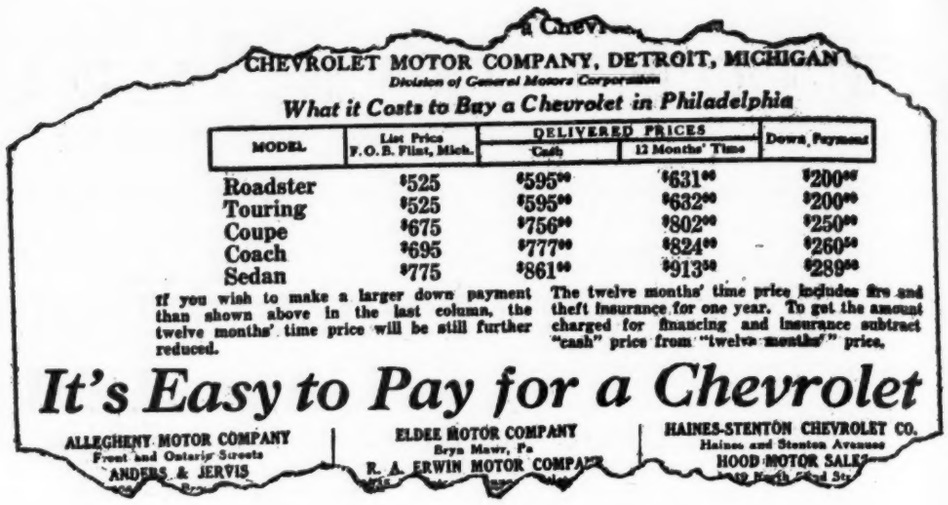
The chief sales appeal of instalment plan buying in the past has been "Take it home for a dollar. Easy payments, etc." A prospect often bought an article he desired because he was so much impressed with the "ease of payment" argument as to feel that keeping up the payments really would necessitate little if any effort on his part. But when the payments began to come due, the task of meeting them didn't always seem so easy as the glowing advertisements had indicated. Cash was required.

Easier to Buy Than to Pay

The ease of payment having been emphasized so strongly in making the original sale, the buyer was likely to feel either aggrieved or worried when the actual working out of the plan wasn't nearly so easy as he had expected. Many easily led purchasers have been sold articles which they never would have bought had they actually realized how much they really had to pay for them.

But despite abuses, instalment buying has prospered because basically it is thoroughly sound and is in line with logical needs of the average citizen. Worked out on a sound, long-swing basis from the sales standpoint, instalment buying can increase infinitely in this country and continue to help rather than hurt both business men and purchasers. There is no quicker way in which permanent stabilization can be reached than by presenting, in connection with every time sale, all of the facts frankly and clearly so that they are thoroughly understood by the purchaser as well as by the seller. Carrying this idea to its logical conclusion would mean that the charges stated be the actual financing cost to the purchaser and that no part of that cost be charged under some other guise.

THIS is the way Chevrolet is advertising its time sales in newspapers of various cities. When a purchaser walks into a dealer's place of business he knows beforehand exactly what the cash delivered price of the car will be, and also the additional amount he will have to pay for financing and insurance if he buys on time


CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation
What it Costs to Buy a Chevrolet in Philadelphia
MODEL
List Price F.O.B. Flint, Mich.
DELIVERED PRICES
Cash
12 Months' Time
Down Payment
Roadster $525 $595.00 $631.00 $200.00
Touring $525 $595.00 $632.00 $200.00
Coupe $675 $756.00 $802.00 $250.00
Coach $695 $777.00 $824.00 $260.00
Sedan $775 $861.00 $913.00 $289.00
If you wish to make a larger down payment than shown above in the last column, the twelve months' time price will be still further reduced.
The twelve months' time price includes fire and theft insurance for one year. To get the amount charged for financing and insurance subtract "cash" price from "twelve months'" price.
It's Easy to Pay for a Chevrolet
ALLEGHENY MOTOR COMPANY
Front and Ontario Streets
ANDERS & JERVIS
ELDEE MOTOR COMPANY
Bryn Mawr, Pa
R. A. ERWIN MOTOR COMPANY
HAINES-STENTON CHEVROLET CO.
Haines and Stenton Avenues
HOOD MOTOR SALES

with full and detailed realization on the part of the buyer of what he is paying for the credit extended is likely to be affected very little by ups or downs in the business situation during the period of payment.

Those car makers who are pushing their time sales plans on this basis are showing real, profound confidence in the instalment buying idea. They must be just as desirous of making sales as anybody else. Their actions indicate that they believe sales can be made when the purchaser is not only permitted, but actually urged, to know what he is being charged for financing. They apparently believe in the time sales idea so strongly as to have no fear of putting the facts before the purchaser in understandable form. Thus they help to make car buying more intelligent and to eliminate from the buying ranks those who might be jazzed into purchasing if the financing costs were soft-pedaled and the "easy payment" idea emphasized more strongly than warranted.

Policy Has Good Features

Having car manufacturers in locally applied national advertising point out the actual financing and insurance cost should have several good effects. Among these would seem to be:

1. The purchaser knows how much he is paying for financing. Buying will thus be on a sound basis and fewer sales will be made to people who can't pay.

2. Knowing how much he has to pay for credit, the buyer, of his own accord, is more likely to increase his down payment as much as possible; the savings involved will be clearer to him than where the financing cost is combined with other charges and thus does not stand out definitely as a factor in the sale.

3. Dealers whose names appear in the locally applied copy will find it difficult, even should they wish to do so, to conceal exhorbitant "handling charges" or to obtain inside discounts on financing or insurance, unless, of course, they can get such a discount without having the charge to the owner made higher than the delivered time price advertised by the factory.

4. The confidence of the public in automobile sales methods and practices will be increased very greatly. An attitude of frankness about facts inevitably breeds confidence.

The importance of this last consideration should not be overlooked at the present time when so much criticism is being leveled at automobile time sales practices by various newspapers and general publications. Anything which tends to indicate that car manufacturers are determined to have sales made only on a basis which means safety in case of business recession will have an excellent effect on the reputation of the automotive industry in the business world as a whole.

An article with the optimistic title "The Instability of the Automobile Industry," for example, in the October 23 issue of *The Annalist* is indicative of the sort of talk about automobile affairs that is becoming current. Emerson Wirt Axe, the author of this article, asks how much justification there is to the present unrestrained bullish enthusiasm for motor stocks and for their high price level. He answers the question by saying, in effect, that the present price of automobile stocks "for an industry having before it all the uncertainties of the automobile business is clearly unjustifiable."

Nobody can quarrel much with Mr. Axe's conclusion about current activities in motor stocks. That their movement is based primarily on market technicalities and speculative movements and only in a distant sense upon the trends of automotive business is pretty generally conceded. But in reaching his conclusion, Mr. Axe combines some particularly clear reasoning with reiteration of theories that have been exploded previously on numerous occasions.

He says, for instance, that "once the total supply of cars required becomes stationary, annual demand will drop to a figure sufficient to take care of replacement—or very much lower than the present annual total of cars produced."

The "total supply of cars required" never will become stationary within any reasonably conceivable future. The time may come fairly soon when the number of first time buyers will increase only in proportion to population increase. That will mean far fewer first time buyers than in the past, but first time buyers will continue to enter the market at least slowly as long as population continues to increase, the only limit being road capacity, which also is increasing constantly.

No Basis for Statement

There is no real basis for the statement that, when this period is reached, the number of cars necessary to take care of replacement requirements will be "very much lower than the present annual total of cars produced." Previous computers for *The Annalist*, if we remember correctly, estimated that registrations may logically be expected to increase to as high as 30,000,000 in this country. If that conservative estimate be accepted as the highest total registration ever likely to be achieved for the United States (and we wouldn't accept it personally) it becomes evident that the replacement market would be something like 3,750,000 vehicles a year—estimating the life of a car as 8 years.

This is not "very much lower than the present annual total of cars produced."

In this connection, Mr. Axe failed to mention at all our constantly growing export trade which this year, for the first time, will exceed half a million vehicles.

In other respects, however, Mr. Axe speaks plainly of things which are concerning most active automotive executives. He points out, for example, that much of the big automotive production of recent years has been based on instalment buying and that "if any tightening of credit or other unfavorable circumstances should make time sales impossible, business would fall off very sharply—much more so than if credit selling never had been resorted to." He adds that "the rapid extension of the automobile market during the past several years has been accomplished through the rapid lowering of selling prices and improvement in the quality of the cars themselves. The limit of this process is not far off." The limit is not far off, probably, as regards price reductions, but it certainly is far off as regards quality improvement.

Comments of this kind, however, are important as showing the tenor of public thought and attitude toward the automotive industry, and should receive careful consideration from executives for that reason.

Some Still Stress Low Terms

Some automobile companies still are urging or condoning the laying of strong emphasis on low down payments in the selling appeal of their dealers. That this plan is a successful sales-maker has been proved by past experiences in other lines. That it is likely to result in a high proportion of repossessions in case of a business decline is equally indicated by past events. Naturally those dealers—and the factories who support the dealers—who are urging low down payments and long terms as the basis of their instalment sales appeals are not stressing the actual cost of the credit to the purchaser. Low down payments and long terms inevitably increase risks and just as inevitably increase the cost to the buyer if the organization extending the credit is to be operated at a profit—as it must be.

The actual lowering of financing costs to the buyer has come recently chiefly through greater control of the situation by factories. But factory control is not essential to a sound handling of the retail instalment situation all along the line. The principles involved in frank statement of costs and facts can be practiced profitably by individual dealers on their own responsibility as well as under duress of factory urging.

Factory Control of Retail Sales

That lowering financing costs for the consumer can be obtained more quickly by increased factory control of the retail situation, however, is indicated by the instances already in operation, such as Chrysler, General Motors, Dodge Bros., Inc., Studebaker and others. In the last few weeks no less than five companies have announced completion of arrangements with a finance company to handle retail financing for dealers on the basis of a nationally applied arrangement headed up in an agreement between the factory and the finance company. That others will follow shortly seems equally certain.

Independent finance companies, dealing with individual dealers, undoubtedly will continue to do a large volume of business even with dealers for those cars whose factory has a national plan. But whoever actually handles the business, it is rapidly becoming clear that the stronger elements in the automotive industry are determined to reduce the cost of financing to the customer to a minimum in the quickest possible time and that the trend to lay all the cards on the table is gaining headway.

ELECTRON, an alloy about 40 per cent lighter than aluminum, which has been available for several years, is now being pushed in England as a competitor of aluminum for automotive parts. Besides lightness, claims made for this metal include machining speeds of 600 yards per minute; possibility of cutting finest threads; will not foul, drag or splinter, thus increasing life of machining tools between sharpenings; castings are non-porous and can be bent without cracking; Electron pistons do not score cylinder walls; is suitable for heavy service.

Comparative tests of Electron and an aluminum alloy containing 2.75 per cent copper and 13.5 per cent zinc gave the following results:

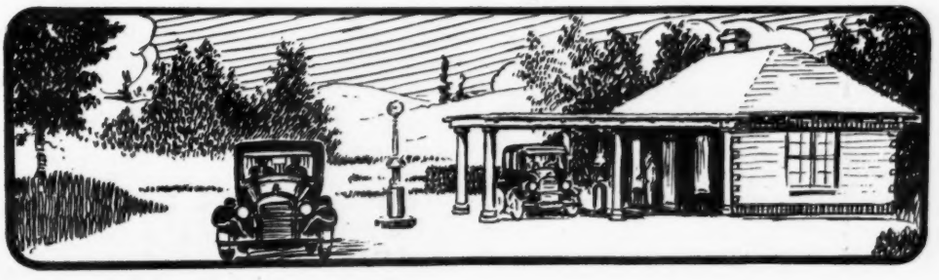
	Specific Gravity	Tensile Strength	Yield	Elongation
Electron	1.84	10 tons	6 tons	5 per cent
Aluminum	2.96	10 tons	6 tons	3 per cent

Several grades of Electron are available. The physical properties of their metal extrusions are as follows:

	Alloy Z1	Alloy V1	Alloy V1 Hard
Specific Gravity	1.81	1.82	1.82
Proportional Limit—Tons to square inch	6–9	14	14–16
Yield point—Tons to square inch	9–11	17–19	20–21
Tensile strength — Tons to square inch	16–18	21–23.5	26–28
Elongation—per cent	15–18	7–9	3–5
Brinell Hardness	46–50	70	90

The sponsors of this metal are F. W. Hughes & Co., Ltd., 204 Great Portland Street, London, W. 1, while sole rights for its use for castings in England have been acquired by Sterling Metals, Ltd., Coventry.

SPONSORED by the Bureau of Standards and the Society of Automotive Engineers, and approved by the American Engineering Standards Committee, an Aeronautic Safety Code has been formulated and accepted as a tentative American standard. This code has been developed under the rules of procedure of the A. E. S. C. by committees organized by the sponsors and final draft of the code was made in April of this year and approved by the A. E. S. C. in October.



Quality Plus Service Won Market

Roy W. Sandford

War gave U. S. manufacturers first opening and field has since been held against all competitors, although European small cars lately have been gaining ground.

By Roy W. Sandford

MR. SANDFORD, the author of this article, is well qualified to write on automotive merchandising conditions in Australia, and his views should be of interest to American car manufacturers, as much of his experience as an Australian dealer has been with American machines.

He was the first dealer in Australia to handle a high-grade American car, having established a Cadillac agency in Sydney in 1909.

He is managing director of Roy W. Sandford, Ltd., of Sydney, which is one of the oldest firms of motor car importers and engineers in Australia. Among the cars for which he has acted as director in the New South Wales territory may be mentioned Cadillac, Chalmers, Arrol-Johnston, Singer, Darracq, Oakland, Roamer and Scripps.

NOWHERE outside of the United States and Canada does the American automobile find greater acceptance than in Australia. For about ten years now, or since shortly after the start of the World War, cars of American design and manufacture have dominated this important market.

There was a time when practically all of the machines used here were of European origin. The United States was known as a great automobile producing country, but Australians held a rather light opinion of American quality and went to England, France, Italy, Belgium and Germany for their motor cars. Such machines as Clement Talbot, Fiat, Benz, Humber, Star, Renault, De Dion, Minerva, Darracq, and a dozen others, were seen in large numbers.

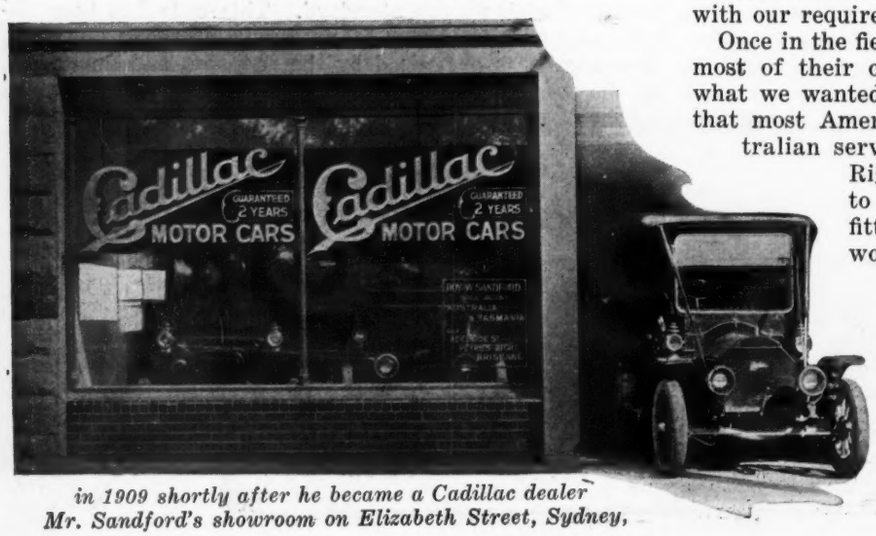
True, a few American makes had penetrated the market as far back as 1906 and 1907, but no American manufacturer had succeeded in really making a name or creating a demand for his product.

America first gained a foothold in the Australian market through a fortuitous circumstance—the World War. But how this advantage, once gained, was held, is another story. There was no element of fortune or circumstance here, but good business judgment and sound merchandising policy.

With the war came a crippling of European industrial and shipping activities insofar as overseas commerce was concerned. Shipment of automobiles from Europe to Australia ceased. Australian Motor car dealers, unable to get further supplies from Europe, turned to the United States. All of the large dealers secured American agencies and dropped their British and Continental connections. The American manufacturers sent out factory representatives to study and investigate Australian conditions, and in most instances altered their machines slightly to comply with our requirements.

Once in the field, the American manufacturers made the most of their opportunity. They proceeded to give us what we wanted and in a short time the public realized that most American cars were better adapted for Australian service than the machines built in Europe. Right hand drives were substituted for left to meet our driving habits; magnetos were fitted; wire wheels and light-colored paintwork were featured; and in some instances more suitable carbureters were placed on the cars destined for Australian delivery.

Some of the large American manufacturers, through their representatives, brought out a standard for the Australian market, and above all, gave their dealers help with the establishment of spare parts depots and advertising allowances.



in 1909 shortly after he became a Cadillac dealer
Mr. Sandford's showroom on Elizabeth Street, Sydney,

for American Cars in Australia

The cumulative effect of these things on the Australian dealer was tremendous, especially as it was this same type of service which consistently had been denied by the British and Continental makers when they were in the saddle. Another factor in the American's favor during this critical period was that he was able to make regular shipments to Australia from Pacific ports throughout the war without interference from submarines.

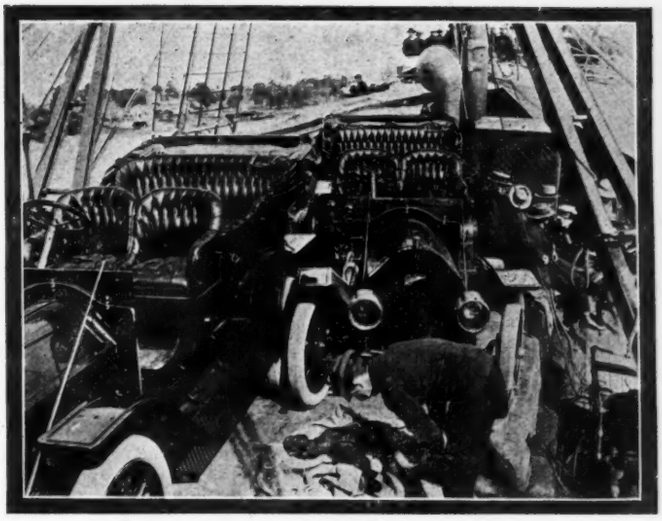
Thus America captured and held the Australian market.

By the time the war was over, Australian dealers and car owners had had a taste of American automobiles and business practices and they liked both. For many years previous, when British and European makers controlled the market, the Australian dealers had constantly sought to impress upon them the peculiar requirements of our trade, but very little notice was taken of these demands. I suppose the European manufacturers considered our market too small to merit special changes and improvements in their products. In this they were mistaken, but they did not realize it until too late.

The main complaints against European cars were that the medium sized ones had not enough horsepower for their weight, while the 20 and 30 hp. machines were just as bad, being correspondingly heavier. Besides not tracking and having no clearance, the cars were fitted with springs which were too light, their front axles were weak, their wooden wheels shrunk in the hot sun, their tires were too small, the radiators did not provide sufficient cooling area and there were a dozen other defects. With a few exceptions the manufacturers refused to remedy these defects and continued to build the same type of car right up to the start of the war.

Whatever chances the British manufacturers might have had of regaining the market after the war were lost through many causes. Chief among these was the shipment of untested new models which were found to be weak in many respects, the absence of factory representatives to cooperate with the dealers in detecting and remedying the shortcomings, and the refusal in many instances of the manufacturers either to take back the faulty machines and supply others, or to cancel orders and refund deposits.

A large proportion of Australian dealers who had handled British or Continental cars before the war ordered either sample models or quantities after the war was over.

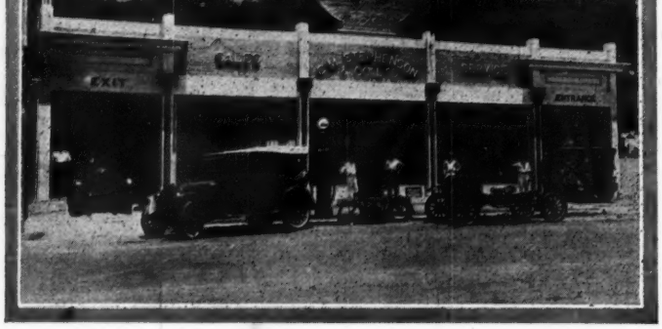


The first 4-cylinder Cadillacs ever seen in Queensland. This picture was taken aboard the boat on which the two cars were shipped from Sydney to Brisbane

In most cases the cars gave general disappointment, not only to the buyers but also to the dealers, who, in order to correct defects, spent hundreds of pounds in manufacturing stronger parts, or ordered new parts from the factory and, pending delivery, furnished their customers with parts taken from new machines, thus tying up their stocks.

Many British factories also advertised in motor magazines during this period that their production facilities were "treble their former size," and that their new models were "supercars, containing all the improvements that

Motoring in New South Wales. Note the American-like appearance of the country, with its vast open spaces. Here, as in America, distances are great and in the rural sections semi-improved roads only are the rule



A modern sales and service station in Australia

British designers developed during the war." The Australians were led to believe these machines would be in reality "supercars" and although the prices were much higher than before the war many cars were bought. Of course the extravagant claims were unjustified; the cars fell far short of expectations.

I know I had to take back some cars only a few months old and substitute brand new American cars, and then I had to sell the old ones at auction for whatever they would bring. I actually lost as much as $2000 a car on some of them.

Mistakes Costly to Britishers

These mistakes were costly to the British manufacturers as they occurred at a time when the American makers were doing business here under a tremendous handicap and when it might have been easy to cut heavily into the American car sales. The low rate of exchange on the pound sterling, together with the increased duty placed by the Australian Government on American automobiles, gave the British a splendid opportunity to recapture the market. But apparently the British plants were utterly demoralized, their workmen untrained and their sources of supply of raw materials completely upset.

During the first half of 1921 the landed cost prices of American cars, due to the rate of exchange, the high freight and the increased duties, caused a severe slump in the market. Then the American manufacturers cut prices and protected the Australian dealers by granting rebates on all cars in stock. This made an extremely favorable impression on the dealers, naturally.

Throughout this period of sales depression the American factories had their representatives on the scene. They knew of the many thousands of automobiles in bond in Australia and they also knew that many Australian dealers would fail unless something was done to help them, as 60 and 90 day notes were falling due on cars that could not be sold. The representatives busied themselves with the problems of the dealers. They cabled their factories for extensions on the notes, took cars from overstocked dealers and placed them with other dealers not so heavily burdened, and, in short, gradually cleared the situation.

Contrast to European Methods

All this was in striking contrast to the attitude of the British and Continental makers. They did not grant rebates on unsold cars. They did not cut down deliveries to help the dealers who had ordered before the slump came. And they did not have representatives on the ground to whom the harassed dealers might appeal.

These facts all tended to strengthen the position of the American manufacturer in the Australian market.

American cars gave good results on Australian roads, they did not cause the dealers any worry, they landed in good condition, started up easily and ran satisfactorily from the beginning. I can assure you that it was quite different with the cars from most other countries, and no one can blame the Australians for continuing to buy American cars in preference to others.

It should be mentioned, however, that during the last two years the British and Continental manufacturers have greatly improved their organizations and products and an ever increasing number of motor cars from these countries are being imported at present. The majority of these machines are of the small type, light in weight and more economical to operate than any car built in the United States. In Australia, where gasoline costs between 50 and 56 cents per Imperial gallon, cars that will average 30 and 40 miles to the gallon make a great appeal.

Good light machines of this type are now being imported in quantity from France, Italy and England. I know of one instance in which more than 300 light British cars arrived in Sydney in one shipment this year.

Present Situation Summarized

This brings us to a survey of the present situation as regards the strength of American and European manufacturers in the Australian market. Here is what we find:

1. The American manufacturers have had a virtual monopoly of the market since 1914.
2. The small European car has recently become an important factor in the field and up to the present nothing has been produced in America to compete with it.
3. In January, 1924, 97 per cent of the automobiles sold in Australia were of American make; in March, 1925, this margin had been cut down to 92 per cent.
4. British and Continental manufacturers have regained some of their lost prestige and are in a much stronger position to make a fresh bid for foreign trade than they were two years ago.

All of which indicates that the American makers are going to find more sales resistance in Australia in the future than they have in the immediate past.

Faults of American Methods

There is another situation confronting American manufacturers which I should like to mention in closing. Among our motor trade the holding of an agency for an American car is considered to be rather a risky thing. In the past certain factory representatives have been sent here with too much power and use it none too wisely. Agencies were taken from old established concerns and given to new firms which never had sold a single car before. Some of the oldest firms in Australia, and some of the largest, were treated shabbily in this manner. Some of them, after losing their agencies, were left with from $10,000 to $20,000 worth of spare parts on their hands, while the new agent was made to purchase a fresh supply for himself from the factory.

Thus there has grown up a group of dealers who stick to other than American cars exclusively. There are others who have tried selling American cars in quantity and who have found that their profits are wiped out by heavy advertising and selling expenses. Most of these have returned to more conservative lines where they are not constantly harried by the cry, "Sell more or we'll take the agency away."

These dealers naturally lean toward European makes and are constantly endeavoring to have the duty raised on American cars in order to broaden the market for their own wares.

Anti-Knock Properties of Gasoline Depend on Cracking

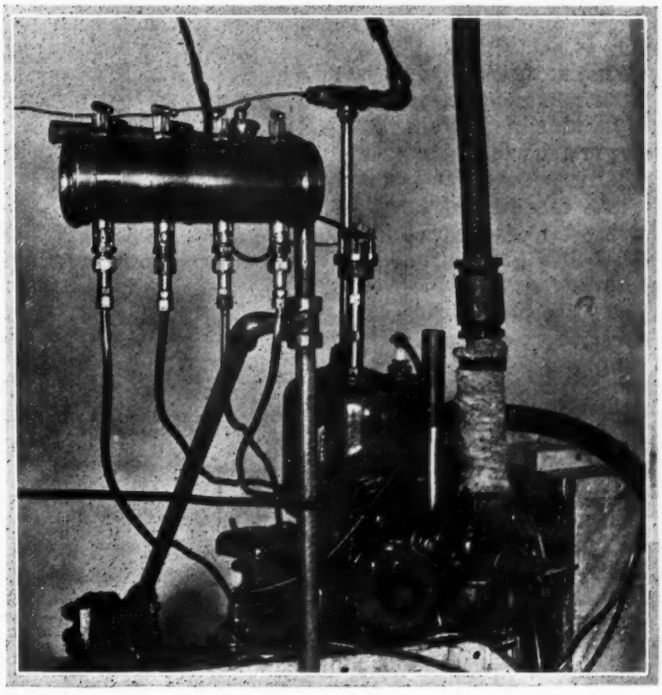
Detonation can be combatted by changes in fuel production. Cracked gasolines are more subject to control than straight runs. Blending improves the latter.

By A. Ludlow Clayden

ANTI-KNOCK gasolines are now being produced by several of the leading refiners and are available throughout the most thickly populated sections of the country. For calling attention to the desirability of such fuels General Motors deserves full credit; even if tetra ethyl lead never comes back again, its short life was not lived in vain. Of course, there always have been anti-knock blends of gasoline and benzol, or other coal products, but the new fuels are strictly gasoline, undoped, unblended petroleum products.

It is hardly yet realized, except by those who have been working on the problem, how greatly ordinary gasolines vary in detonation characteristics. They have always done so, but the fact passed unheeded because there was neither any recognized test for detonation nor any demand for one.

Today a few of the refiners are regularly testing for detonation and enough has been learnt about making gasoline of the anti-knock type to insure a supply adequate to care for the probable growth in demand. The public is actually asking for anti-knock fuels in a few localities where educational campaigns have been undertaken; in one or two small sections it is already hard to sell gasoline of poor detonation quality. The motoring public takes up new ideas rapidly, so that conditions that are now local are likely to become general in short order.



1—Small marine engine used to test detonation of fuels. Every batch of gasoline made by the Sun Oil Co. undergoes the bouncing pin test.

There are just two sorts of gasoline, straight run and cracked. The former is the light material existing in the crude, removed and purified, the latter is light material manufactured from heavier oil. So much is common knowledge.

Straight run fuel is the cheaper to produce, and a good deal more than half the present supply is of this kind, but apart from any other consideration, the proportion of cracked to straight run must increase, because the supply of crude suitable for straight running is decreasing, while the demand for gasoline is increasing. Only by more and more cracking can supply keep pace with demand. With straight run fuel a refiner has very little control over detonation quality. California crude will in general give a good anti-knock gas, Oklahoma a poor one, Texas somewhere between the two, and so on for the other crudes.

The reason for this is fairly clear. Crude oils all contain members of more than one petroleum hydro-carbon series. Of the three main families, the paraffins, naphthenes and benzenes, all are to be found in most crudes. The paraffins are bad detonators, the naphthenes much better and the benzenes best of all. So, if a crude is rich in paraffins and poor in the other two, it will almost certainly produce a straight gasoline inferior to one from another crude that is richer in naphthenes and contains less paraffins, inferior from the detonation point, that is.

Unfortunately, there is very little of the benzene compounds in American oil, but many crudes are rich in naphthenes. Some of the richest, however, are heavy crudes containing but little gasoline, and the gasoline content of a naphthene-rich crude is sometimes largely paraffins; so there is very little that can be done towards meeting an anti-knock demand by selecting crudes.

Cracking is explainable by the analogy of taking a large lump of coal and splitting it into smaller lumps, but it is only a partially true analogy because it is incomplete. A heavy molecule of paraffin when split may produce several smaller molecules, but they will not necessarily be paraffins; they will very probably be naphthenes and may possibly be benzenes. It is as though from the breaking up of a lump of soft coal,

several smaller lumps of hard coal had been the result.

A very short trip into the chemistry of the subject shows how this can happen. Thus C12H26 is one of the paraffins and C4H8, one of the naphthenes, and if the paraffin is split into three with the loss of two atoms of hydrogen, the naphthene may be formed. To what extent this sort of process goes on in cracking is problematic, but it has been proved that it does occur; also, the paraffins cannot be cracked into simpler forms of themselves. For example, take C10H22. Just split in two it should make C5H11, which does not exist; for the lighter molecule to be a paraffin two more atoms of hydrogen are required to give C5H12, but by losing two hydrogen atoms we can get C5H10, which is a naphthene.

Causes Carbon Formation

Fortunately there is plenty of crude consisting largely of heavy naphthenes and these, being of the formula C*n*H2*n*, can always be split in even halves—at least theoretically. So far cracking processes always have resulted in the formation of a good deal of carbon, which means that some of the petroleum molecules are completely broken up into the elemental carbon and hydrogen, and the history of cracking is the history of ways and means for controlling the breaking up so as to carry it just so far and no further. The older processes were costly to operate because of the high losses but immense strides have been made and the day is in sight when cracked gasoline will be no more expensive to make than straight run.

It is probable that so far as producing anti-knock qualities goes,cracking processes will get ahead of the requirements. If this proves to be true it will be of great advantage because it will permit the mixing of very good cracked fuels with less good straight run gasolines. For many years to come there is going to be a very large, even though a steadily shrinking, supply of straight run "gas," which is unlikely to change much in character from what we have today. Assuming, as is reasonable, that cracked fuel is of better detonating quality and, as is certain, that more and more will be cracked, the trend will be for gasoline in general steadily to get better suited for higher compressions. This should fully take care of the automobile industry, for a sudden stepping up of compressions would be much more troublesome than a gradual one. It must not be forgotten that as compressions rise, the work to be done by valves and spark plugs becomes harder, and anything which increases mean effective pressures involves higher stressing of parts.

Specifications in Limelight

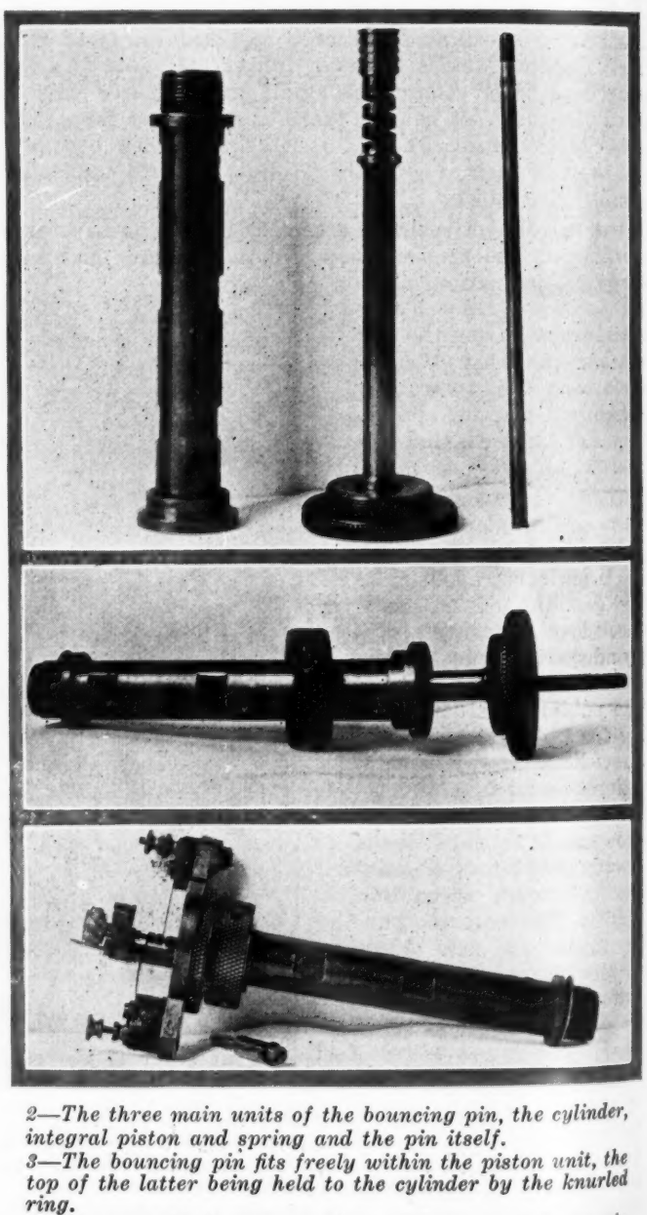
As noted recently in *Automotive Industries*, gasoline specifications are receiving much reconsideration. It is now known to almost everyone that the specific gravity is no indication of the quality of a fuel. It merely indicates vaguely from what crude it came, and if we are seeking good detonation quality the preference would be for heavy rather than light. Volatility only follows gravity when all the constituents of the fuel are of the same chemical series. It is easily grasped that the paraffins, with their two extra hydrogen atoms, will be lighter than corresponding naphthenes, yet the volatility of the latter is not correspondingly affected.

Taking two extremes, C6H14 or hexane, which is a common paraffin, has a specific gravity of only 0.67 against 0.87 for benzene with the formula C6H6, yet their respective boiling points are only 14 deg. apart. This is talking specific gravity, not Beaume gravity, by which latter scale the paraffin ranks 78, compared with only 31 for the benzene.

Another interesting fact is that with the paraffin series the lighter the molecules, the better from the detonation aspect, while in the benzene series the reverse is the case. This also is unfortunate, since by "topping" crude oil lightly we can almost always obtain some light paraffins while by cracking to only a moderate extent we can produce the medium and heavy constituents of gasoline—in the naphthene series—better than we can the very light members. Mixing the two gives the necessary range of volatility with good detonation characteristics.

At present we lack a standard method for testing detonation and there is no accepted scale by which it can be measured. The Midgley bouncing pin gives good results, but these are entirely comparative and the numerical difference between two fuels as measured will vary with the engine in which the pin is placed, with the temperature of any one engine, with spark advance, with mixture strength and so on. Using a variable compression engine and adjusting it till the knock is judged by the operator to be the same for the fuel under test as it was for the previous sample gives check results, but it is even further from a standardizable test than the Midgley instrument.

Petroleum chemists hope to discover a purely chemical test. For instance, aniline and gasoline are soluble in each



2—The three main units of the bouncing pin, the cylinder, integral piston and spring and the pin itself.
3—The bouncing pin fits freely within the piston unit, the top of the latter being held to the cylinder by the knurled ring.
4—The assembled pin apparatus. Clearances between pin head and contact blades is important, also clearance between contacts.

other only at moderate temperatures, but if benzene is added the aniline stays in solution longer as the sample is chilled. The aniline test does actually disclose the percentage of benzenes in a fuel, but it does not respond to the naphthenes as accurately. Something similar, however, may exist, and if it can be discovered then the detonating quality of a fuel might be fairly well indicated by a laboratory test of a sort that might be incorporated in specifications. There are two "mights" and a "may" in the last sentence and they about express the status of chemical detonation tests at the present time.

The Midgley instrument as demonstrated in lectures looks the extreme of simplicity, but, like many other tools of the sort, it has many tricks. It gives numerical values for detonation and with the writer's method of using it, the higher the value the better the fuel. The principal snag is that we do not know if the numerical values are really proportional to fuel characteristics.

Methods Employed in Laboratory

For instance, if the fuel taken as the basis of comparison has a figure of merit of 100, another may have one of 50, but this does not necessarily mean that the energy expended in detonation is really twice as great for the poorer fuel; it may be more or less. It does follow, however, that testing always in the same engine, the same comparative figures of merit will be obtained for the same two fuels. The writer has been using the Midgley instrument for nearly two years and there are several other owners of bouncing pins who have not succeeded in getting consistent results, so the methods employed in the Sun Oil Company's laboratory may be of interest.

Briefly to redescribe the instrument, it consists of a small cylinder which is placed in a second spark plug hole. In the cylinder is a small piston backed by a very strong spring. Loose within the cylinder is a steel rod of which the lower end rests on the small piston; the upper end clears by about 0.01 in. the lower of two blades carrying platinum contacts. When there is no detonation the piston does not move and the pin does not bounce, so the contacts are not closed, but when pressure rises rapidly enough to cause audible knocking the pin leaps away from the piston and closes the contacts for an instant.

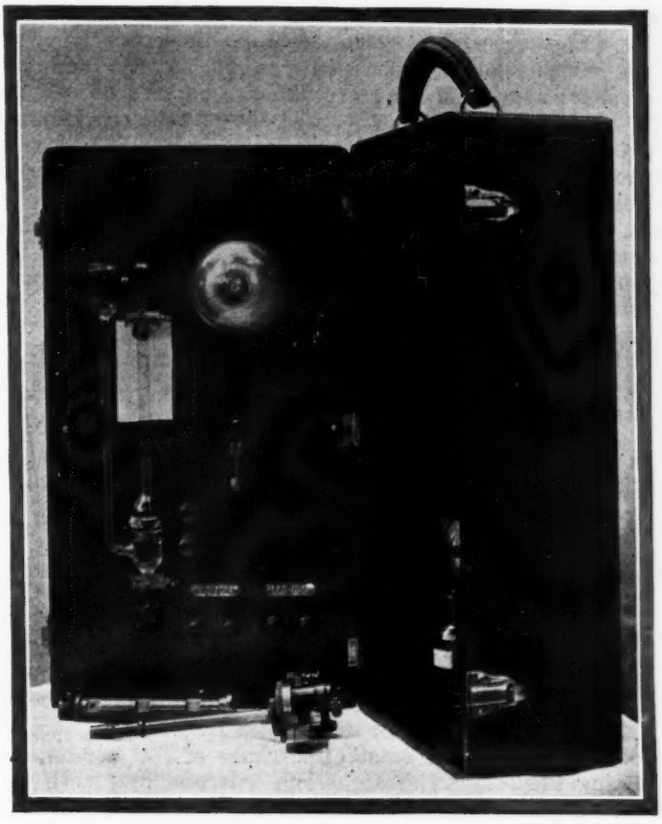
Current Through U Tube

Direct current is led to the contacts through a U tube containing acidulated water. Every time the contacts close some electrolysis takes place and the gas formed collects in one arm or the U tube, where it can be measured. The more violent the detonation the more gas will be formed at each contact closure, or the more in a given time of running at constant speed. The action of the instrument depends upon the following factors:

Extreme cleanliness of all moving parts.
Clearance between top of pin and lower contact blade.
Clearance between contact points.
Accurate facing and cleaning of the contacts.
Absence of lubricating oil.
Absence of soot.
Regularity of temperature of the instrument.
Spark advance.
Mixture richness.
Humidity of the atmosphere.
Temperature of the atmosphere.
Perfect valve seating.

Variations in any one of these things can throw out the reading or make it erratic, but cleanliness is the most important. It is essential to take the instrument completely apart and go over every bit of it every few hours of running.

The engine used by the writer is a Regal marine type



5—The U tube in which gas formed by electrolysis is collected to measure detonation. Current goes first through the lamp and then the water.

with one cylinder, bore 4 in. and stroke 5 in. This has a special alloy piston which raises the compression to 5.5 to 1. An electric generator is direct coupled to the engine and for starting is fed with 150 volts D. C. When the engine is running it pumps back into the line and this holds the speed steady at approximately 450 r.p.m. When the engine is switched off it continues to run, being driven by the generator. This method of setting up makes for speed in changing over from one fuel to another, which is a decided advantage.

The writer's method of observing the amount of electrolysis is to take the time with a stop watch for the production of one cubic centimeter of gas, the U tube being graduated in tenths. The fuel supply is so regulated that with convenient adjustments for the pin it will produce the one cc. in 100 seconds. No adjustments are altered on the pin, and when it is taken apart it is reassembled as nearly as possible as before. In starting to work, the engine is warmed up and run for at least ten minutes on the standard fuel, and then the mixture strength is adjusted by the carbureter metering pin till a time of between 98 and 102 seconds for 1 cc. of gas formation has been obtained.

Carbureter Drained

Fuel is then cut off, the carburetor drained and the second fuel turned in, which takes about one minute. The engine is then run on this for one minute and the time for 1 cc. is again measured. Immediately the fuel is changed back and a check run made. It should not show a variation of more than 2 per cent from the first run. Usually three check comparisons are made, but many more are sometimes necessary.

With this engine 100 seconds for 1 cc. means distinctly audible knocking; 50 seconds very violent knocking, and

150 seconds, while measurable, is not accompanied with knocking that can be heard. Check results on the same fuel are obtainable anywhere between 30 seconds and 150 seconds; above 150 there are liable to be variations of 10 to 20 per cent between runs. The 100 seconds represents a good gas, 60 seconds a thoroughly bad one and 150 a very good one, but very good cracked gasoline or benzol mixtures rich in benzenes may run the equivalent of 300 seconds. In order to test such fuels either a piston giving higher compression must be used or the clearances between the pin contacts and the pin reduced. Spark advance can be used as a control only to a very limited extent and it has been found best to run with an absolutely fixed spark.

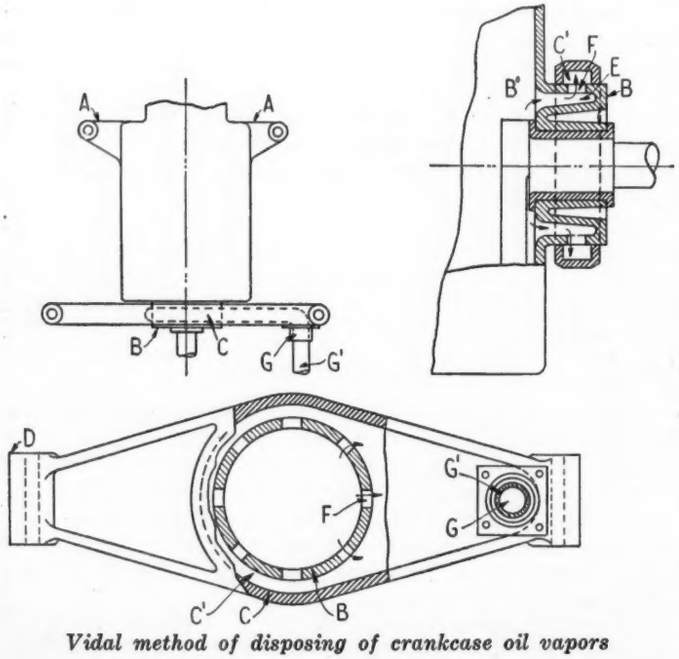
A detail which also has been found advantageous is to lubricate the engine by drip feeds, giving the piston a minimum of oil. This keeps the instrument quite dry and when it is taken apart the soot can easily be wiped off the little piston. When much oil reaches the pin it forms deposits causing the little piston to stick in its cylinder, and the bouncing pin itself does not bounce properly unless dry and clean.

Just to give a comparative idea of what can be done in reducing detonation by cracking, experience with one particular crude may be interesting. This oil gave a straight run gasoline of good general quality but with a detonation figure of only 60, about normal for gasolines on sale in the East. After having had the straight run material removed, a deeper cut was cracked and gave a resulting product so good that it was far outside the range of the instrument. Mixing the original straight run half and half with the cracked gave a figure of merit slightly better than 150 and the distillation curves for the straight run and for the cracked were closely similar.

This particular experiment by no means represents the limit but is quoted only to emphasize the point that finished gasoline owes its qualities far more to its process of manufacture than to the original crude whence it came.

A Novel Crankcase Vent

A NOVEL arrangement of the crankcase vent, whereby the oil fumes from the engine are discharged at the rear of the car and cannot possibly get into the body and annoy passengers, has been worked out by a British engineer. Use is made of what may be called an inverted three-point support for the engine, there being two crankcase feet at the forward end and a trunnion support at the rear. At the rear end the crankcase is provided with a boss extension of cylindrical form which fits within a trunnion bracket extending across the frame and provided with a lug at each end by which it is bolted down to the frame. By making the boss extension of convoluted form, with an annulus communicating with the interior of the crankcase, and through a series of holes with the interior of the trunnion bracket, the only vapor escaping from the crankcase is led through a hollow portion of the trunnion bracket to a discharge pipe secured to the bracket near one end, the pipe extending toward the rear.



Vidal method of disposing of crankcase oil vapors

Metallic Ductile Thorium

PURE metallic ductile thorium has been produced for the first time, it is claimed, by the research laboratories of the Westinghouse Lamp Company.

Thorium is the active constituent of practically all radio tube filaments. Dr. H. C. Rentschler, head of the research department, and Dr. J. W. Marden explain that the present method of making radio tube filaments consists of compounding thorium oxide in the tungsten wire, as thorium throws off electrons profusely even at a very low temperature.

Thorium produced by the new method is said to have a purity greater than that of commercial aluminum, the second highest atomic weight of any known element, a hardness about that of soft iron and a specific gravity nearly 50 per cent greater. It has a melting point higher than platinum, is easily machined and can be worked cold.

The Westinghouse laboratories have manufactured thorium by the new method on a commercial scale in the form of swaged rods, cold worked wire, filament, ribbon, bars, disks, turnings and powder, so that it can be made in any shape in which it could possibly be used. Specimens of this new metal attracted much interest at the recent exposition of chemical industries in New York City.

Dr. Rentschler says the full value of metallic ductile thorium can be determined only in time. To illustrate this he points out that tungsten, which some thirty years ago was regarded as a useless scientific curiosity, today is the basis of practically all electric lamps, X-ray tubes, high speed metal cutting tools and many other similar applications of large commercial value.

EXPERIMENTS have been made at the National Physical Laboratory in England on the effects of initial pressure and temperature on the production of detonation in closed vessels, but the results obtained are not in accordance with the observations of automobile engineers. Working at an initial temperature of 212 deg. Fahr. and a pressure of 95 lb. p. sq. in. absolute, it was found that in a closed vessel the tendency to knock increases with the fuel content of the mixture, especially in the cases of hexane and gasoline. With a rich benzene mixture the knock was eliminated by increasing the initial temperature from 212 to 572 deg. Fahr. With hexane the addition of about 7 per cent of burnt gas from the previous combustion had a similar effect.

With normal gasoline-air and hexane-air mixtures of 13 to 1 or 14 to 1, increase in temperature favored detonation more than increase in pressure, while with a normal benzene-air mixture of 12 to 1, neither an increase in the temperature nor an increase in the pressure produced a knock.

Just Among Ourselves

Simpson Opposes Truck Branches for Weak Firms

T. M. SIMPSON, secretary, Continental Motors Corp., expressed himself at the recent M. & A. M. A. convention as opposed to the installation of branches by truck companies except in those cases where the working capital is sufficient to permit operation at a loss for two or three years after installation. He called on his own experience as a credit man to show how branches had eaten up the capital of several companies before they could properly get on their feet. Coming from so keen an observer as Mr. Simpson, we feel this observation is worth passing on to whom it may concern. The numerous theories and principles which get involved in the average discussion of truck merchandising methods often make any argument on the subject end in a mental stalemate and some times in a practical debacle. The view of a man who just looks at the financial results as a basis for judgment is worth thinking about, particularly when the man is one who is the author of more than one act of the automotive drama which might be called "Behind the Balance Sheet."

Trolley Lines Get a Lesson From Ford

JUST after finishing the article about Ford's present position in the low priced field which appeared in our Oct. 29 issue, we picked up a current issue of the *Electric Railway Journal* and found these interesting comments in a lead editorial touching somewhat on the same subject, but applying a lesson to the trolley industry: "Henry Ford has a sharper insight into the mass mind of America than any other automobile maker. So long as his product was the only reliable low-priced article, he did not care how much criticism was directed at its ungainly outlines or its invariably sable shade. 'Take it or leave it,' said the wizard of Dearborn—and most of them took. Finally, now that his worthy rivals have offered good-looking low-priced cars, Mr. Ford has promptly slashed his prices and succumbed to the 'streamline' demand. Today he has made a further concession to the public—the new Fords will be available in hues that cheer rather than those that sadden the landscape. Thus the great Henry maintains his reputation for sagacity. He sees that cheapness and reliability no longer suffice to sell a maximum number of his vehicles; that the jibes at their ugliness caused hesitation among thin-skinned prospects; and that the American people want comfort above all. Can street railways afford to ignore this lesson? What boots it to cry 'Our wares are cheapest' to people who lead the world in comforts and luxuries?"

Motor Stock Values and Automotive Soundness

A WRITER in the *New York Evening World* has figured up that 14 motor stocks increased in value by some $369,740,000 during the first three weeks of October. These same stocks have increased in value of the low for the year by $971,240,000. While these huge increases probably cannot be justified on the basis of any striking change in automotive conditions over eight months ago, they can be interpreted as an indication that the financial world has for the first time come into a full realization of the attractiveness of the automotive industry as an investment proposition. The essential soundness of the industry generally is becoming understood by the entire business world despite caustic comments which still come as regards temporary ups and downs.

A Lot of Criticism That Isn't Justified

SOME business writers recently have made much of the fact that the remarkable upward swing in automotive stocks is predicated largely on speculative factors and only partly on economic trends within the industry itself. And in going about to prove that pretty well conceded contention, they have predicted much future woe for the industry, basing their claims on the idea that the saturation point has been reached, that time payments have gotten out of hand entirely and that a general state of debility may be expected before many months have rolled by. In more analytical parts of the magazine we have debated these predictions with a seriousness which we sometimes think may not entirely be deserved. We'd like to say here, however, that it's darned near time for the limelight to pass on to some other industries. The automobile industry has had some sharp ups and downs; that can't be denied. Probably it will have some more. But a number of other industries have wide fluctuations in production and sales; some of them worse than the automotive industry.

Musical Instruments and Clothing, for Instance

TIME sales are being made on far more liberal terms by certain musical instrument makers than by any automobile dealers, while the clothing and textile industries constantly suffer from violent seasonal fluctuations, as bad if not worse than those experienced by car makers. The automotive industry has serious problems which must be met; but it's not the only one. It has been getting more than its share of calamity howling. And Pollyanna hasn't stuck her shoes under our bed, either.

N. G. S.

Traction Company Building Own Buses From Standard Parts

Public Service Corporation of New Jersey designs 27-passenger city type vehicle which may eventually replace all other types now in use on its routes. Production is under way at Irvington.

By K. W. Stillman

As told briefly in last week's news section of AUTOMOTIVE INDUSTRIES, the Public Service Corp. of New Jersey is manufacturing a bus of its own design which it intends to use on its many bus routes throughout the State. The project is frankly an experiment and has been started for several reasons.

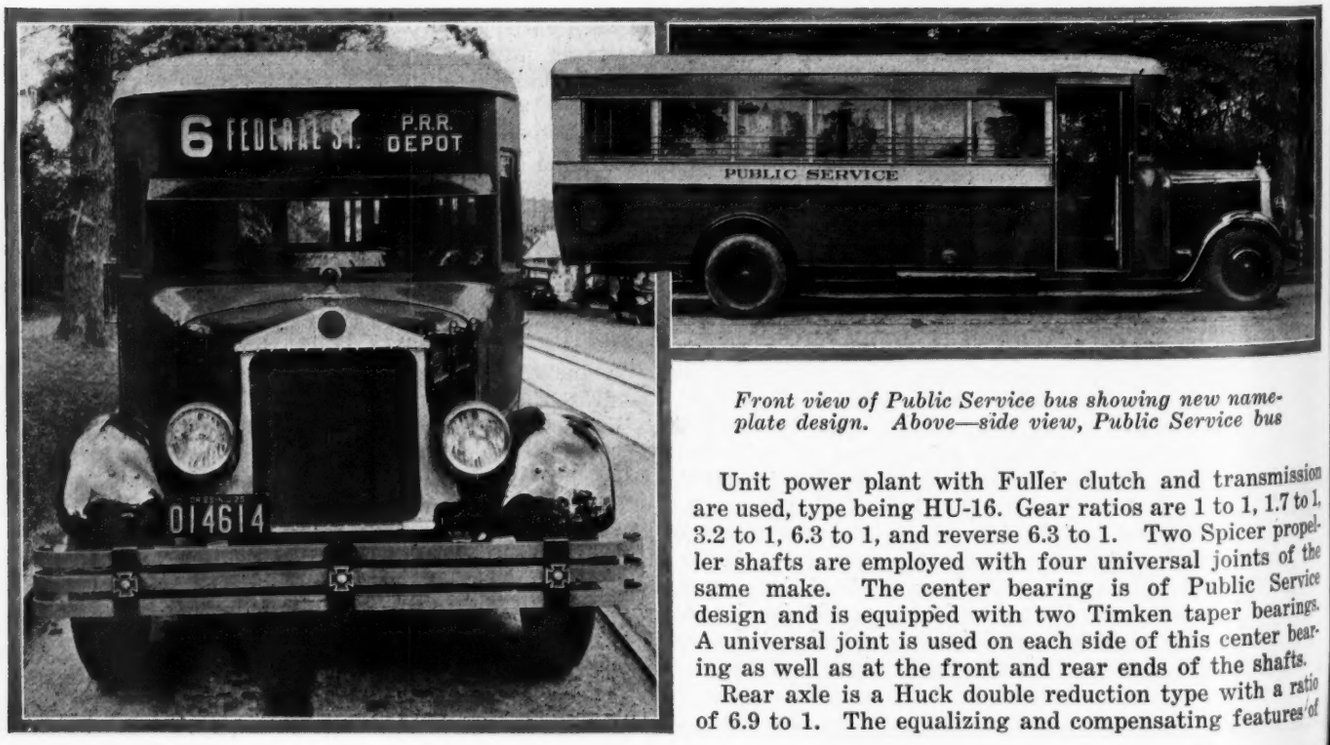
In taking over a large number of independent bus lines operating in its territory, the Public Service Corp. has acquired buses of 58 different makes and of nearly every design. Since the corporation performs all its own maintenance work in keeping these buses in operating condition a personnel has been developed which is familiar with all kinds of buses and is quite capable of completely assembling a bus chassis. Also operation of the 900 or more buses of many descriptions has afforded an excellent opportunity for comparing the relative values of different designs.

For a number of years the Public Service Corp. has been building its own street car bodies and has extended this work to cover bus bodies in recent years.

Since the corporation already has the necessary personnel and equipment to build its own bodies and to assemble chassis, it was believed that considerable economy might be obtained by purchasing standard parts from parts manufacturers and assembling them in the Public Service shop. Also, in view of the mass of information on bus performance obtained from operating records it was thought possible to produce a bus which might be more suitable in all respects for the particular service required than was otherwise obtainable. Finally, in the event that the experiment did not prove successful and the assembling work should be discontinued, it was believed that much valuable information might be gained from the venture which would assist bus makers in building buses better to meet the severe service requirements of mass transportation units.

Buda Six-Cylinder Engine

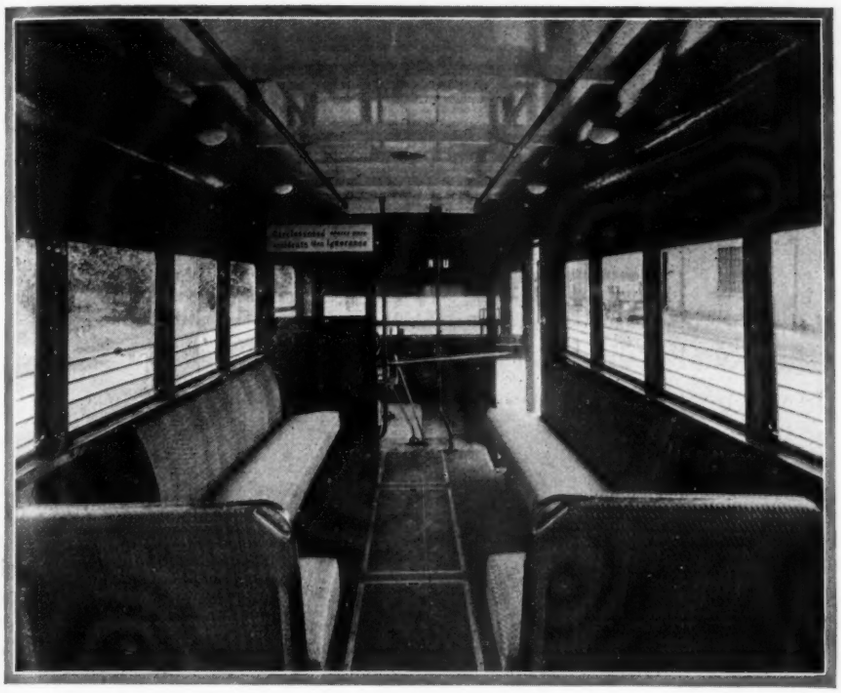
Power is furnished by a Buda "BUS" six cylinder L-head engine with 4 in. bore and 5⅛ stroke with an S. A. E. rating of 38.4 hp. Cylinders are cast en bloc. Detailed description of this engine appeared in AUTOMOTIVE INDUSTRIES for May 7, 1925. Three point suspension is used. North East starting and lighting system, Zenith carbureter, and Bosch magneto are standard.



Front view of Public Service bus showing new nameplate design. Above—side view, Public Service bus

Unit power plant with Fuller clutch and transmission are used, type being HU-16. Gear ratios are 1 to 1, 1.7 to 1, 3.2 to 1, 6.3 to 1, and reverse 6.3 to 1. Two Spicer propeller shafts are employed with four universal joints of the same make. The center bearing is of Public Service design and is equipped with two Timken taper bearings. A universal joint is used on each side of this center bearing as well as at the front and rear ends of the shafts.

Rear axle is a Huck double reduction type with a ratio of 6.9 to 1. The equalizing and compensating features of



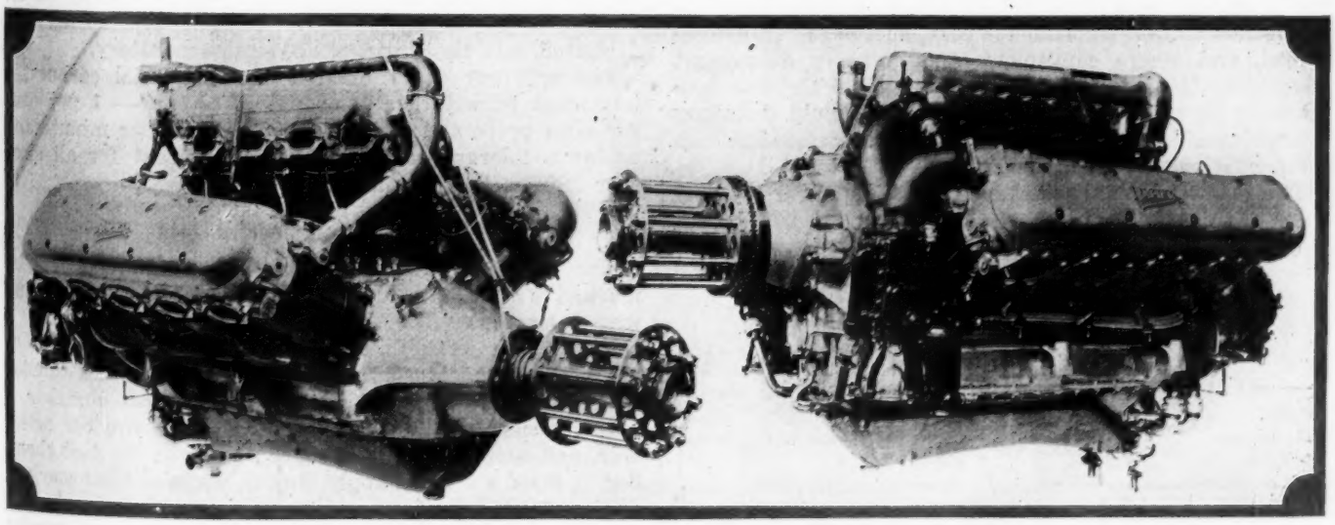
Interior view of 27-passenger city type bus built by Public Service Corporation

the brake equipment included with the Huck axle are expected to be especially valuable in bus work. Budd disk wheels, mounting 34 by 7 in. pneumatic tires, dual on the rear are employed. Brakes are used on the rear wheels only and are of the internal expanding type. The service and emergency brakes work on the same drums.

The frame is an 8 in. section of heat treated alloy steel with conventional kick-up over the rear axle. Steering gear is Ross cam and lever type. Wheel base is 200 in. A Stewart vacuum tank with strainer between the storage tank and and the vacuum tank is used. The radiator is a G. & O. A Duplex speed governor operated from the transmission and acting on the engine makes speeds in excess of 27 m.p.h. impossible.

The body is a 27-passenger city type which follows the general practice of Public Service in its other bodies, with longitudinal seats at the front, cross seats at the rear, and emergency door at the center rear. Rattan seats are used. Entrance door opens 26 in. and aisle width between cross seats is 19 in. An assembly shop has been fitted up in the Corporation's plant at Irvington, N. J., near Newark, with all necessary facilities for bus production.

Napier Airplane Engine as Changed for Racing Purposes



THE Napier "Lion" British airplane engine, as redesigned for racing purposes, was a center of interest at the recent Schneider Cup seaplane races at Baltimore, Md. Both British entries (one of which finished second while the other was disabled during a trial flight) were equipped with engines of this type. The photographs above show the standard Napier "Lion" gear drive engine (at right) and the direct-drive racing model which was developed from the former by increasing the crankshaft speed from 2000 to 2700 r.p.m., lengthening the stroke and increasing the compression ratio, thus raising the horsepower from 450 to about 700. It is now claimed to be the lightest water-cooled airplane engine per horsepower of pound weight thus far designed.

Method of Calibrating Carbureter Jets Standardized in England

Engineering Standards Association's plan provides for use of master jets at National Laboratory, and reference jets for regular work, the latter calibrated from master jets with benzol

IN the past different makers of carbureters have used their own methods of calibrating and marking carbureter jets, but there has been no common standard of reference. Further, jets of the same make, size and nominal diameter did not necessarily pass the same amount of fuel under similar conditions, so various British users as well as manufacturers some time ago adopted a flow basis of calibration in lieu of the previous dimensional calibration.

In order that one uniform method of calibration and marking should be recognized, the British Engineering Standards Association was requested by the Air Ministry and other users to include in their work on the standardization of aircraft components, the standardization of the calibration and marking of carbureter jets. The Association has now issued a report on this subject, and the specification includes recommendations as to the standard method of calibration and marking, as well as particulars of the master instrument and jets to be established for reference purposes.

Master Machine Deposited

A master jet calibrating machine and a set of accurately constructed master jets have been deposited with the National Physical Laboratory as a standard of reference for jet sizes.

The Association recommends that, during the transition period, and where convenient, the marking at present adopted by the carbureter makers as well as the standard marking be used, and that the makers should definitely establish and issue tables showing the comparison between their existing sizes and the B. E. S. A. sizes.

The following definitions have been adopted for the purposes of this specification:

(a) Master Jets—The absolute standard jets which have been deposited at the National Physical Laboratory for verifying the accuracy of the reference jets.

(b) Reference Jets—Jets used in the jet calibrating machine as a basis of reference in calibrating commercial carbureter jets.

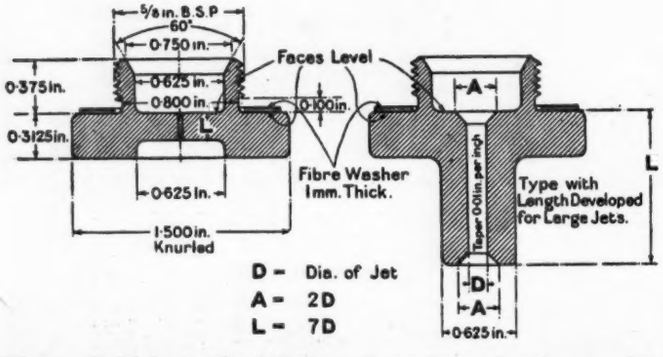


Fig. 1—British standard design of master and reference jets

The Association recommends that master and reference jets be calibrated by measurement of the flow in cubic centimeters per minute of pure benzol (conforming to an earlier B. E. S. A. specification) through jet orifices, under a constant pressure head of 50 cm. and at a temperature of 60 deg. F. It also recommends that the standard method of calibrating commercial carbureter jets be by comparison of the flow of gasoline at 60 deg. F. through the jet with the flow through reference jets calibrated as mentioned above.

The design of master and reference jets to be used for this purpose is shown in Fig. 1. A plain reamed orifice is shown, the diameter of which has a taper of 0.010 in. per inch of length, with the length of restriction, including chamfers, equal to seven times the diameter of the orifice.

An accurately calibrated and marked set of master jets of this design, ranging in size from 20 to 2,000 cc. flow per minute, and increasing by steps of approximately 20 cc. up to 500 cc., and by steps of approximately 50 cc. from 500 cc. to 2,000 cc. have been constructed and deposited with the National Physical Laboratory.

The accuracy of calibration of commercial carbureter jets must be within a tolerance of + or — 1 per cent for sizes up to and including 200 cc. flow per minute and within a tolerance of + or — ½ per cent for all sizes over 200 cc. flow per minute.

To Mark Commercial Jets

The Association recommends that commercial jets be marked with figures denoting the flow in cc. p. m. and with the letters "B. S." to denote British Standard.

The master jet calibrating machine (Fig. 2) consists of a substantial backboard upon which is mounted a tubular reservoir *A* having at its upper end a float chamber *B* with inverted needle valve mechanism. Above the reservoir, and connected by large size piping to the float chamber, is fitted a benzol supply tank *C*, while at the lower end of the reservoir is a stop valve *D* of special design having a nozzle threaded to take the standard form of master and reference jets. Immediately below the stop valve is fitted a cup *E* pivoting on a fulcrum pin by means of which the benzol discharged through the jet can be led away to a collector tank *F* placed at the bottom of the board, or, alternatively, diverted into a measuring vessel. The lever operating this cup is interconnected to stop-watch *G*.

In order to carry out the calibrating operation the jet is fitted to the instrument and the flow of benzol started by giving the stop valve a partial rotary movement which brings passage ways, drilled through the nozzle reservoir bottom, into alignment. When this flow has steadied down, the cup is tripped by a movement of the operating levers *H*, which also automatically starts the stop watch, and the benzol is diverted uninterruptedly into the measuring vessel *J*. The approximate quantity required having been obtained, the cup is again tripped back to normal position. The flow of benzol passes away to the collector tank, while that contained in the measuring vessel is compared with the time registered by the stop watch. This operation is repeated, with suitable reaming of the jet, until the desired size or capacity in cc. p. m. is arrived at.

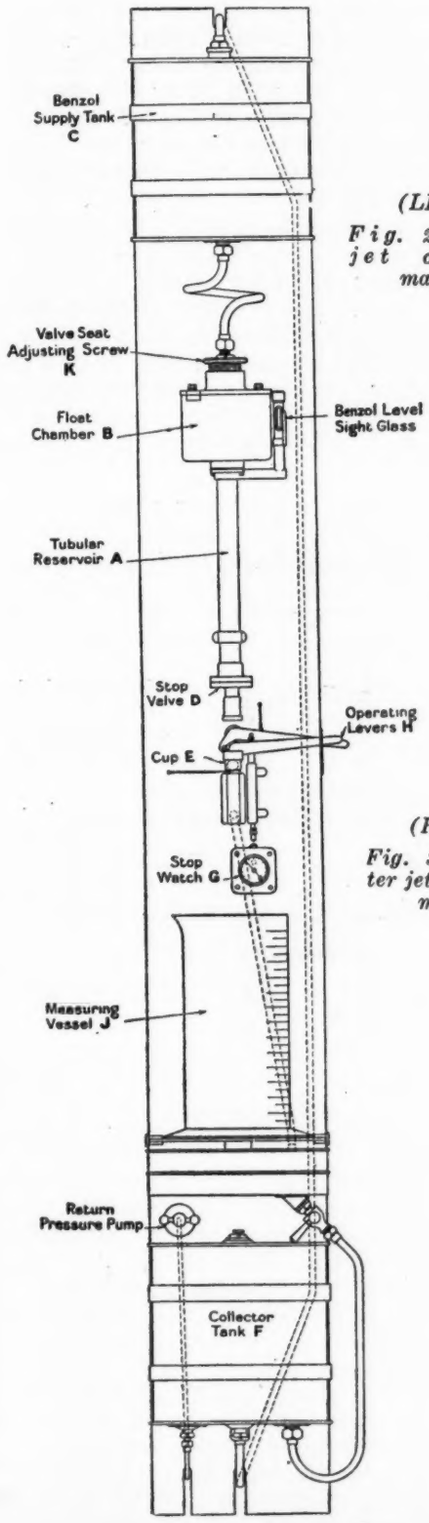
The dimensions of the reservoir and float chamber are such that a constant pressure head of 50 cm. is maintained over the jet. The area of the various passage ways is also very much greater than that of the largest jet to be calibrated, so that an ample and unrestricted flow is assured.

Provision for Adjustment

Provision is made for adjustment of the valve seating *K* in order to correct any slight difference in the pressure head that may occur when calibrating jets of extreme sizes, and for returning the benzol from the collector tank to the main supply tank as often as may be necessary.

With this type of machine (Fig. 3) it is not necessary to measure the discharge from the jet during a given period of time, the size or capacity of the jet being visibly indicated upon one or the other of two graduated scale plates.

The construction and action of the machine is as follows: Gasoline is supplied from the top tank *B* through a filter and cock *C* to float chamber *A*, which is connected by

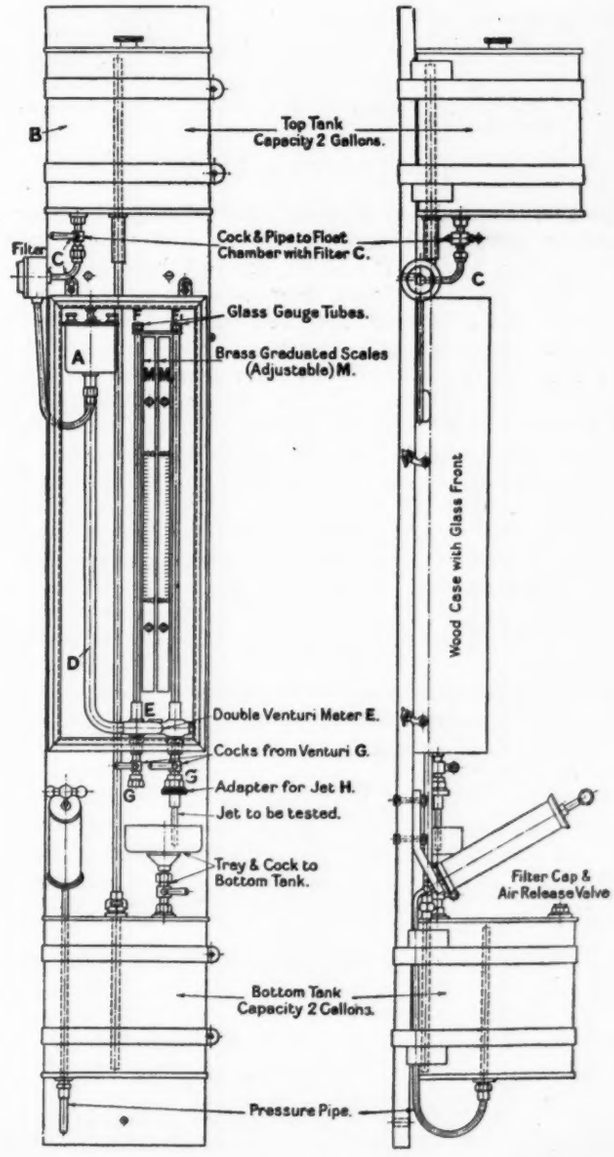


(LEFT)

Fig. 2.—Master jet calibrating machine

(RIGHT)

Fig. 3—Carbureter jet calibrating machine


Top Tank Capacity 2 Gallons.
Cock & Pipe to Float Chamber with Filter C.
Filter
Glass Gauge Tubes.
Brass Graduated Scales (Adjustable) M.
Wood Case with Glass Front
Double Venturi Meter E.
Cocks from Venturi G.
Adapter for Jet H.
Jet to be tested.
Tray & Cock to Bottom Tank.
Filter Cap & Air Release Valve
Bottom Tank Capacity 2 Gallons.
Pressure Pipe.

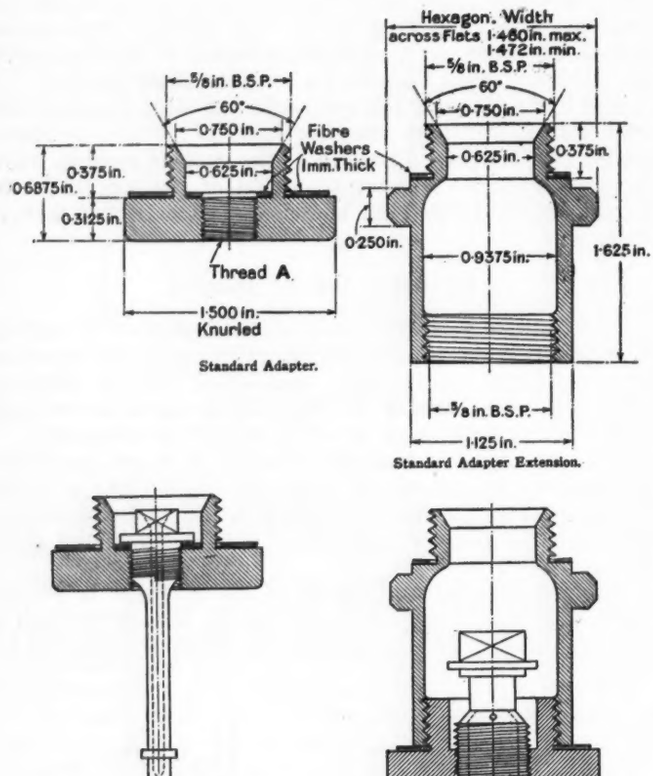


Fig. 4—Standard adapter and adapter extension

pipe *D* to a modified form of double venturi meter *E*. Leading upwards from each side of this venturi meter are two gage glasses *F* and *F*1, open at their top ends.

Between the gage glasses there are two adjustable scale plates *M* and *M*1, which may be graduated so as to form a continuous reading, the left hand scale from, say, 20 to 100 cc., and the right hand scale from 100 to 400 cc. Directly below the gage glasses, and on to the outlet side of the venturi meters, are cocks *G* threaded to take an adapter into which is fitted the jet to be calibrated.

Upon turning on the cock *C* the gasoline flowing from the top tank *B* rises in both gage glasses to a level controlled by the float chamber *A*. If a jet be now fixed in either of the adapters and the corresponding cock be opened, the gasoline in the gage glass above it will fall to a level varying in accordance with the size of the jet, and it is this level, read off on scale *M* or *M*1, which gives the size or calibration of the jet. The scale plates themselves are, in the first instance, graduated from the levels obtained when using reference jets of standard design and construction, calibrated in accordance with the Standard Specification.

It is essential that with this method of calibration, the setting of the scale plates be frequently checked against reference jets and that a standard form of adapter be used for coupling the carbureter jet to the calibrating machine. The dimensions of the standard form of adapter are shown in Fig. 4.

Care must be taken that there are no air locks in any part of the machine, particularly in the venturi meter or jet adapters. Air release valves are provided on the cocks *G*, which should be opened for a few seconds after the insertion of the jet to be calibrated and while gasoline is flowing through it. Only clean strained gasoline should be used, preferably of a specific gravity 0.72 to 0.75 at 60 deg. F.

Load Capacity of Ball Bearings

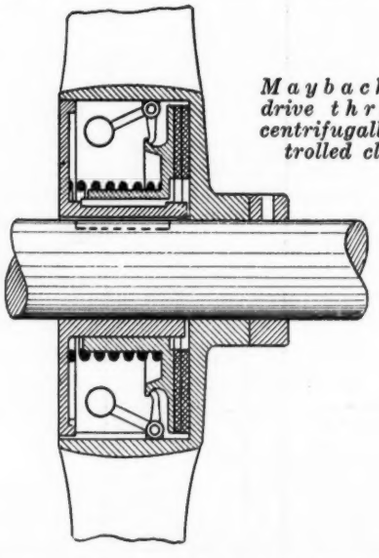
IN an article published in *Der Motorwagen*, Paul Bruhl engineer of the Rheinland Machine Works, comes to the conclusion that the common formula for the load capacity of annular ball bearings, viz., $Q=0.2zd^2k$, where Q is the load capacity, z the number of balls; d the diameter of balls and k a coefficient, is not applicable to practical cases—first, because the accuracy of the mounted ball bearing cannot be made sufficiently high; and second, because the coefficient k is not constant but varies in an unknown way with the speed of revolution and the diameter of the balls.

For this reason, to be safe, one must figure on the whole load being carried by a single ball or, in case of very accurate manufacture, by slightly more. Moreover, as in the case of ball bearings with filling slot, the slots must not extend all the way down to the ball track (which limits the number of balls which can be gotten into the bearing). It is entirely useless to increase the number of balls at the cost of the filling slots.

The size of balls to be used in a bearing of given outside and inside diameters must not be made any greater than possible without sacrificing equality of load capacity of the races and balls. The capacity of the balls must not be increased at the expense of decreased capacity of the races.

Therefore, the idea that the capacity of a ball bearing is the greater, the greater number of balls it contains and the larger the diameter of ball—assuming a given outside diameter and bore—is not correct in its general form.

Clutch for Radiator Fan



Maybach fan drive through centrifugally controlled clutch

THE Maybach Motor Works has patented a centrifugally controlled clutch for the radiator fan, the object of which is to permit more nearly uniform cooling of the engine at all speeds. With the usual arrangement of a positive drive between the engine crankshaft and the fan, which results in the fan being driven in direct proportion to the engine speed under all conditions, the result usually is that the cooling effect is inadequate on grades when the engine runs slowly but under full load, whereas on the level the cooling effect is excessive. The object of the invention covered by the patent referred to is to provide a drive whereby the fan reaches almost its maximum speed at approximately 1000 r.p.m. of the engine and does not materially exceed this speed at 3000 r.p.m.

Tires Have Little Effect on Steering

Tests made with Ross-O-Graph reveal that effort required varies but slightly with different tire makes and treads

By F. F. Chandler

MANY claims and counter claims are made about the steering qualities of different kinds of tire. Every driver becomes accustomed to the particular steering characteristics of the car he drives. Many a driver thinks he knows to a certainty that his particular car is the pink of perfection and that the tires and their particular form of tread are equally excellent. Tire salesmen argue this point to owners as well as to car manufacturers.

The Ross-o-graph, which is a steering-effort measuring instrument designed and owned by the Ross Gear and Tool Company of Lafayette, Ind., was recently called upon to settle such an argument. The assertion was made that tires and the form of tread made by "A" would steer with less effort on the part of the driver than tires made by "B." "B" obtained the use of the Ross-o-graph in order to get a chart record of the actual facts. The resulting records should be of interest to drivers and manufacturers alike.

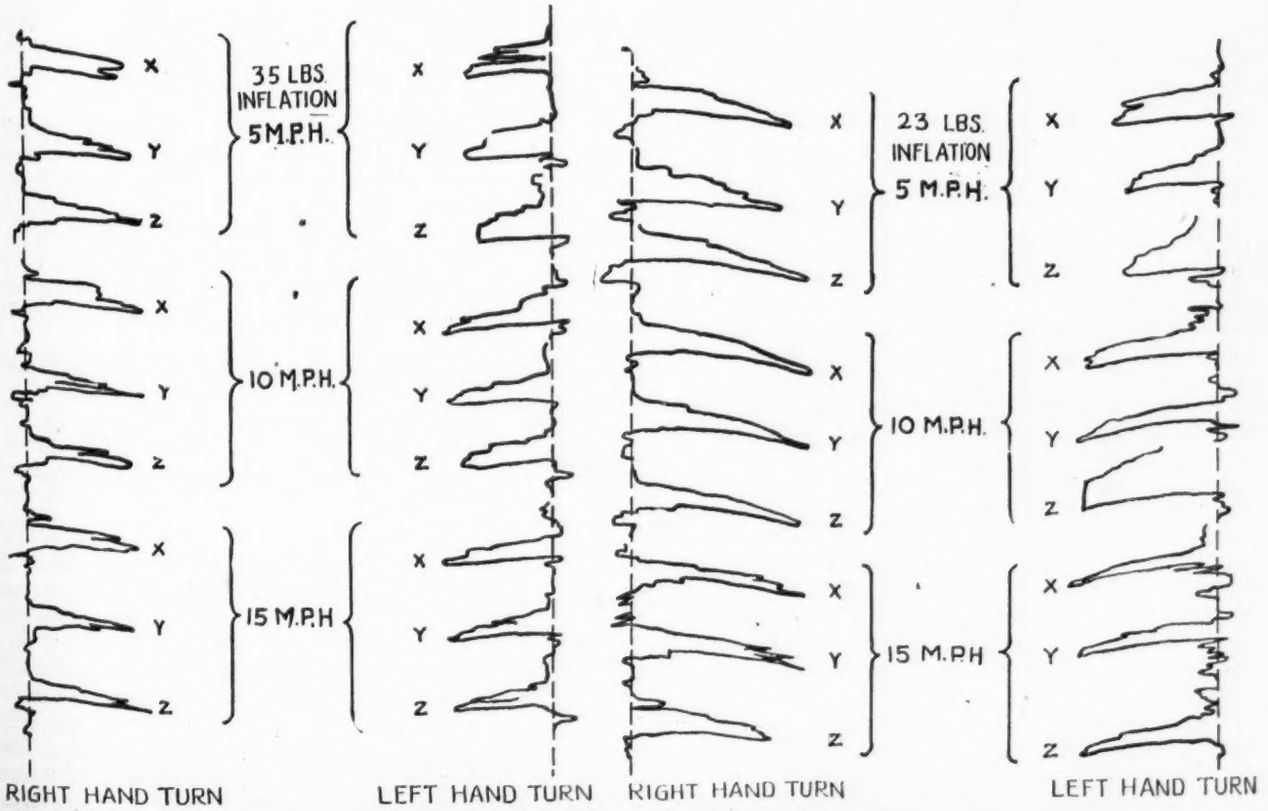
One set of tires made by "A" and two sets of tires of different tread characteristics made by "B" were each tested in turn on the same car and under identical conditions. All of the tires were a combination of the smooth and anti-skid types.

Each series of tests consisted of driving the car with tires inflated to 35 lbs. pressure over brick streets at 5, 10 and 15 m.p.h. At each speed a right hand turn was made at a street intersection, and after that a left hand turn, so that the steering efforts required for both turns could be recorded. The same series of runs was then made over the same course with the inflation pressure reduced to 23 lbs. Each of the three sets of tires was put through the above described series.

Sections of the charts produced by the Ross-o-graph at the time the turns were being made are reproduced herewith. In order that these chart sections may be compared, a little explanation is necessary.

Measuring Driving Effort

The vertical spaced line in each is a zero line. If the record made by the Ross-o-graph, that is, the black, irregular line, falls to the right of this zero line, it forms a record of the effort exerted by the driver in making a right hand turn. The distance of this black line from the zero line is a measure of the driver's effort. Each 1/16 inch (of the original chart) represents one pound driving effort at the rim of the steering wheel. If the black line falls to the left of the zero line, then the effort to make a left hand turn is registered in the same way.

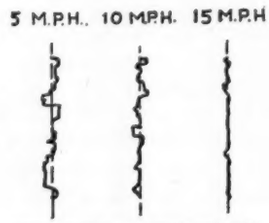


Steering effort diagrams for right angle turns

The different kind of treads are represented by letters X, Y and Z. In order that these three treads can be compared quickly, all of the right hand and left hand turns have been grouped.

It may be observed from right hand steering records that the actual difference in steering effort with different makes of tires is slight. The records of left hand steering are not quite as uniform, but these also show that there is practically no difference.

It will be observed also, that the distances to the left of the zero line are shorter than those to the right, which show that cars steer somewhat more easily on left hand



Steering effort diagrams for straight ahead run

turns. This is characteristic of all left hand drive cars. With right hand drives this condition is reversed.

While these tests were being made to secure a record of steering effort in making turns, the car, of course, was also driven straight ahead, and the Ross-o-graph recorded the steering effort under these conditions at speeds of 5, 10 and 15 m.p.h. All of these chart records were made while the car was being driven on brick pavement.

We all know that cars steer harder at low speeds, and it is interesting to see from these charts how much greater the effort really is. At 15 m.p.h., the steering effort was practically nothing. These records were obtained with "A's" tires, but substantially the same results were secured with "B's" tires.

With only 23 lbs. inflation pressure no difference in steering effort required was observable at 5 and 10 m.p.h. However, had the speed been raised above 15 m.p.h the effort required to hold the wheel would have been less than at the lower speeds.

A New Coincidental Lock

BOTH transmission and ignition are locked by a quarter turn of a single key in a new coincidental lock which has been brought out by Charles G. Trosien of Pontiac, Mich. The lock is located in a boss at the rear of the gear shift lever tower and ordinarily is about flush with the floor boards. That position of the lock which secures the gear shifting gate rods is identical with the Security transmission lock. The ignition switch, which has been added, may be used exclusively for controlling the low tension ignition circuit, but preferably it is placed in series with the usual ignition switch on the instrument board.

In this arrangement, the dash switch controls the circuit under operating conditions and may be used to shut off the engine while descending steep grades without interfering with any other portion of the car's mechanism. On the other hand, when the car is parked, both ignition and transmission can be locked securely by a quarter turn of the key of the coincidental lock at the floor board.

As illustrated by Fig. 1, the steel lock carrier is secured in the boss on the gear case cover by a conventional spring-operated, concealed pin which prevents the removal of the entire lock. Within the carrier is placed a barrel lock having the usual brass body and stem. The key opening is protected by a spring actuated stamped steel cover which swings clear to allow the insertion of the key.

A slot cut in the lower end of the lock stem receives the upper end of the hardened steel shifting gate lock spindle, the two being held together by a cross pin which is riveted over at both ends. The lower end of the gate lock spindle is machined to form a narrow central lip and is piloted in a drilled hole which is machined halfway between the holes for the gate rods. When in the unlocked condition, the flat faces of the tongue are parallel to the gate rods and, therefore, allow the locking balls to recede from their notches and clear the normal surface of the gate rods. A quarter turn of the lock when the gear shift lever is in the neutral position brings the wide portion of the lip into a crosswise position and forces the lock balls into their respective notches in the gate rods, thus preventing gear shifting.

A bronze surfaced fibre cam, which is riveted on the locking spindle as shown, controls the ignition circuit. When the gear shift is unlocked, this cam forces one side of a bronze spring switch into contact with the other side and

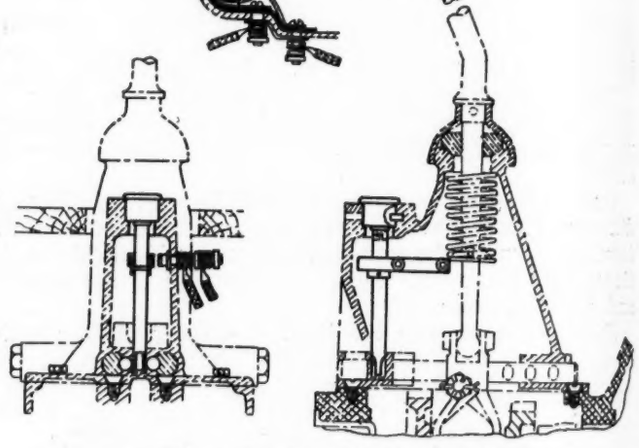


Fig. 1. Trosien Coincidental lock

thus closes the ignition circuit. When the spindle is turned through 90 deg. to lock the gears, the cam goes out of contact with one blade of the switch and thus opens the ignition circuit. As shown, the switch members are located inside of the gear case cover and therefore are secure from tampering. Binding posts which extend through to the outside of the case to receive the terminals in the ignition circuit secure the switch to the inside of the cover.

In the accompanying illustration, lock balls are used, as the gear shifting gate rods are close together. However, variations of this arrangement to suit different spacing of these rods and the use of various forms of lock plugs are already in use. This lock has received the approval of the Underwriters' Laboratory.

A COOPERATIVE investigation of the toxic gases from Mexican and other high sulphur petroleums and products has been made by the Bureau of Mines, funds to meet the expenses of the work having been contributed by leading oil companies. It appears that Mexican crude oils contain a great deal of sulphur and in the handling of the crude in shipping and in the refinery sulphuretted hydrogen escapes. This is a poisonous gas and a number of accidents have occurred in refineries handling such crudes. The results of the investigation are given in Bulletin 231 of the Bureau of Mines.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

In Market for Buses

THE Automotive Division of the Department of Commerce learns through consular advices that one of the larger Mexican cities is contemplating purchase of between 40 and 50 motor buses. These buses are to be used in the place of street railway lines which are now being removed. Interested manufacturers may secure further information by communicating with the Automotive Division.

Mexico Lowers Duties

THE Mexican import duty on separate parts and primary material employed in the construction of automobiles and trucks, provided they are assembled in Mexico, will be reduced on November 16 to 5 per cent ad valorem, which is one-half of the duty on assembled automobiles and trucks. The rate on separate parts not used in construction or assembling in Mexico still remains at 20 per cent ad valorem.

Australian Imports

THE Automotive Division of the Department of Commerce is advised that Australian automotive imports for the second quarter were valued as follows: Motor chassis £2,955,000; motor bodies £330,032; motorcycles £183,777; chassis parts £105,062. Australian stocks are described as fair, it being explained that the strike delayed shipment of European cars. Distributors are described as optimistic regarding future business and consider tariff change unlikely to seriously affect the sale of American cars. Improvement is reported in tractors and trucks.

Want Catalogs in Egypt

THE Department of Commerce and Industry in Cairo, Egypt, would be glad to receive catalogs from American manufacturers of automotive products, Trade Commissioner Richard A. May, at Alexandria, cables the Automotive Division of the Department of Commerce. If catalogs or descriptive circulars are sent it would be well to mention the fact that your action has been guided by the Automotive Section of the Commerce Department and the Alexandria, Egypt, office of the Department of Commerce.

Trade With Italy Grows

ONLY the lowest-priced American automobiles can be sold extensively in Italy, owing to the well-developed Italian automotive industry and the protective import duties, according to advices to the Automotive Division of the Department of Commerce by Acting Commercial Attache A. A. Osborne at Rome. Italy's total imports of automobiles from the United States during the first half of 1925, however, reached a value of 11,113,000 lire as against 3,030,000 lire in the first half of 1924. The number of American motorcycles imported doubled. This increase is noteworthy in view of the keen competition with Italian and British motorcycles.

Chile Forms Highway Congress

THE Chilean Government has promulgated a decree creating an institution of a permanent character called the "Congress de Carreteras" or Highway Congress, the purpose of which will be to better the roads of Chile and to keep in touch with modern improvements. This measure was adopted on the recommendation of the First National Roads Conference recently held in Santiago. The Government Board created by the decree will include various heads of government departments as well as private individuals.

Bus Field in Cuba

CUBA is enjoying a good market for buses. A new omnibus line has been inaugurated between Habana, Madruga and Matanzas covering a considerable distance. The omnibus service is constantly increasing, and, as seen from the statistics previously furnished, 1,159 were registered in the Island early in 1925.

Big Gain in Tractor Exports

EXPORT of motor tractors by the United States during August, 1925, totaling 9,261, valued at $5,396,654, was chiefly responsible for a new high mark in the exports of agricultural implements from this country during this month. The total of tractors exported during the month of August, 1925, was slightly less than one-half of the total exported during the year 1923, and was almost equal to the amount exported in the year 1922, while it was more than twice as great as the amount shipped in the year 1921.

British Manufacturers Busy

SEPTEMBER showed a seasonal decline in production and export of motor cars by the United Kingdom over August but better than last year. The market is so good there manufacturers and importers are rushing new models to take advantage of the demand and plants report sufficient orders taken to insure full time all winter.

The London General Omnibus Company has just been granted permission by Scotland Yard to experiment with double-deck buses in the London Metropolitan area. While upper deck covered buses have been in operation in various parts of Great Britain for a number of years, traffic conditions in London proper have not been such as to lead Scotland Yard to believe that they could be safely licensed in this district.

Tariff Change May be Postponed

IN view of the objections which have been entered on the proposed change in the automobile tariff of Czechoslovakia, the Automotive Division of the Department of Commerce is informed, it is very probable that the projected change will go over until the spring of 1926.

New Airplane Has a High Safety Factor and Folding Wings

Alexander Aircraft Co. produces ship with cruising speed of 90 m.p.h., landing speed 31 m.p.h., and safety factor of 7.7. To sell for $2,475

AN up-to-date four-place airplane built with one of the highest factors of safety used in aircraft design, and which has a cruising speed of 90 m.p.h. but lands at only 31 m.p.h., enabling it to be brought down in a small field, is the achievement of a newcomer in the aircraft field, the Alexander Aircraft Company of Denver, Colorado. The first of these planes, the "Eaglerock," has recently been completed and has been subjected to flying tests. It is built to sell for $2,475.

The ship, which is fitted with a Curtiss OX-5 90 hp. motor, weighs empty slightly over 1000 lb., and can carry a useful load of 800 lb. It has a wing-span of 31 ft. 9 in., but the folding wings incorporated in the ship enable it to be stored in a space less than 12 ft. wide. Its length, overall, is 22 ft. 6 in., and it is 9 ft. high. It has a maximum speed of 90 miles per hour, and a landing speed of 31 miles per hour. Its climb with full load is 550 feet per minute.

Extreme Safety is Sought

It has been the effort of Lieut. Daniel Noonan, designer of the ship, to build into the plane the utmost attainable in safety. A safety factor of 7.7 has been used in the design of the ship, one of the highest factors ever used in aircraft design. The ship is fitted in addition with an automatic stabilizer, providing longitudinal stability with varying loads.

The U. S. A. No. 27 high-lift-wing section, the same as that used in the Douglas World Cruisers, is used. Wing spars are of I-section spruce. Ribs are of the built-up type, each rib being tested in production. Duralumin tubing is used for internal bracing and double drift wires protect against drift strains. Warren truss type interplane bracing takes care of the folding wing feature.

While following the general trend of modern design, being built practically entirely of steel tubing, the assembly of the fusilage differs from the method used in most of the steel tube ships in that the tubes are not welded at the joints but are held together by clamps, enabling the ship to be knocked down for shipping. The fuselage covering is of fabric, laced on, enabling the pilot to remove the covering quickly on the field and replace any tube which might have been damaged.

No Aileron Control Wires

No aileron control wires are used in the ship, controls being by duralumin tubes, from stick to torque tubes and through the wings to the ailerons. With one aileron dead, the other still functions, sufficient aileron area having been allowed to furnish control of the ship with but one surface operating. Rudder and elevator controls are of the straight line type without pulleys. The rudder is balanced. The entire ship is Valsparred, the varnish being applied by a special spray process, said to effectively prevent the penetration of moisture.

The landing gear is made up of steel tubing, following the general practice used in modern pursuit ships. An extra wheel is provided to be used in the place of the tail-skid for taxiing to and from landing fields. This wheel, which is steerable, is provided with an emergency brake

"Eaglerock" airplane built by Alexander Aircraft Co. and equipped with Curtiss OX-5 90-hp. motor

which the rudder controls. The plane can thus operate on the average highway when not too crowded to permit the use of the propellers, much like the average automobile, the wings being folded back.

The passenger compartment is designed for comfort in cross-country traveling. Seats are 36 inches wide. Vanity cases and a compartment for goggles, maps, helmet, etc., are provided. There is also a compartment just back of the pilot's seat large enough for a suit case, tie-down ropes, tools, etc. The front cock-pit has a trap door in the floor for aerial photography.

The whole plane is designed for quantity production, and simplicity in construction has been aimed at throughout.

Following is a brief summary of the specifications:

Weight	about 1,000 lb.
Span	31 ft. 9 in.
Span, wings folded	11 ft.
Overall length	33 ft. 8 in.
Height	9 ft.
Airfoil	U. S. A. No. 27
Cruising radius	400 miles
Useful load	800 lb.
Maximum speed	90 m. p. h.
Landing speed	31 m.p.h.
Climb with full load	550 ft. per min.
Motor, Curtiss OX-5	90 hp.
Price, ship on field, Denver	$2,475

South Africa Has Parking Problem

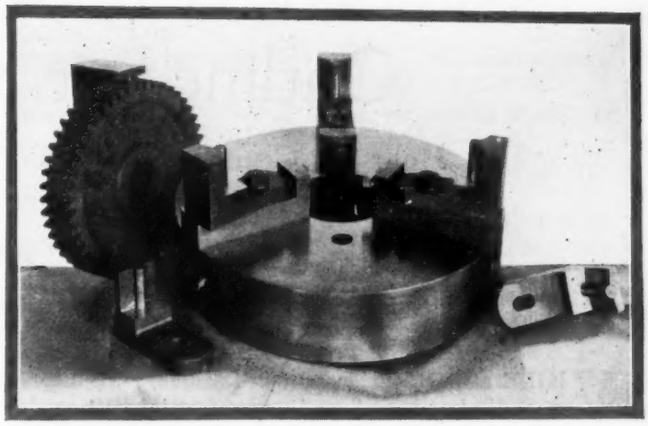
LOOKING for a place to park in South Africa is becoming as acute a matter as in America. There are prohibited areas in most of the larger cities and the country motorist visiting town is finding it increasingly difficult to locate a place to leave his car. The consequence is that outside the prohibited areas congestion of parked cars is considerable, and new by-laws are often necessary to create fresh prohibited areas.

While traffic congestion here has not nearly reached the American proportions, the position is considered sufficiently serious to warrant the formation of traffic control boards in nearly all the big towns. Luckily many of the principal streets of South African towns are wide, and, by the creation of one-way thoroughfares when the roads have not a desirable width, considerable relief to traffic congestion can be obtained. Up to the present one-way streets have not been generally adopted, and the movement may be said to be in the experimental stage. In Johannesburg where there are more motor vehicles than in any other South African town, traffic control is not as good as it should be, and there is a campaign against the municipality and police by the newspapers in this connection.

A German Fuel Meter

IN Germany a fuel meter is being marketed which is based on the property of the vacuum tank to discharge a definite quantity every time the float trips the atmospheric valve. From the top of the vacuum tank there is a tube connection to the consumption indicator mounted on the dash. This latter has a dial over which moves a pointer, the latter indicating both the amount of fuel left in the tank and the trip consumption. The total consumption is indicated by a counter showing through a slot in the face of the dial, the same as the odometer dial through the face of a speedometer. No details of the method of operating the indicating and counting mechanism are given in our source of information.

Chuck for Gear Production



Skinner chuck for holding gears on pitch circle

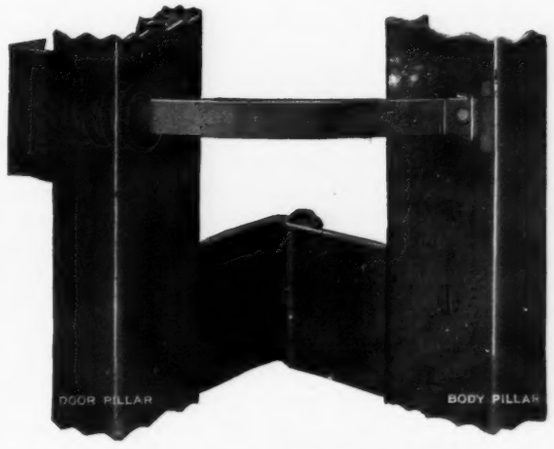
A CHUCK for holding gears on the pitch circle, so that the hole may be turned or ground out true with that circle, has been developed by the Skinner Chuck Co., New Britain, Conn. This is a three-jaw universal chuck with heavy body, rack and pinions, and it is claimed that it will stand great strain. A two-piece jaw is used, the top piece being adapted for holding gears on the pitch line, and it is also adjustable in two directions. This makes it possible to hold gears with both odd and even numbers of teeth, and to true them up absolutely. The chuck is made to hold gears from 3 in. pitch diameter up.

If desired this chuck can be made dust-proof so that, in grinding the center hole in finished hardened gears, no dust can get into the working parts of the chuck and cause undue wear.

New Concealed Door Check

A NEW type of concealed door check, which employs a clock spring steel band, has been developed by The Concealed Door Check Co., Kokomo, Ind. The construction is very simple, as may be seen from the accompanying cut, consisting of a spring steel connector and a heavy coil spring shock absorber.

Severe tests given this new device indicate that it will stand up well under severe usage. For steel body construction this type check is especially recommended since it is easier to install than many other devices used for this purpose. A door check of the same construction has been designed for composite body work.



An installation of the new concealed door check with steel body construction

New Method to Avoid Headlight Glare Outlined at S. A. E. Meeting

Henry M. Crane advocates dimming of left lamp only and rotating lens of right lamp nine degrees so as to give low light on the left side and high light on right. Plan simple and inexpensive.

By Leslie S. Gillette

WHILE a new development in headlamp engineering was disclosed and methods of combatting glare discussed at the Detroit Section Meeting of the S. A. E., November 5, the general concensus of opinion was that present forms of headlamps are satisfactory when properly adjusted and that rigid enforcement of the headlamp laws is the best solution of the problem at this time. More than 200 were present at the meeting, which was held in the General Motors Building.

The new development was disclosed by Henry M. Crane of the General Motors Corp., in a paper entitled "A Possible Solution of the Headlight Problem."

Up to the present the bright lights of cars have been controlled by a dimming device and by dipping reflectors. In the first case, when a driver suddenly changes from bright to dim he gropes along the road without clear vision ahead, while in the case of the dipping reflectors the arrangement is too costly for installation except on a few cars, and under certain conditions sets up an objectionable glare when the lights are turned down toward a smooth concrete or wet pavement.

Using Mr. Crane's arrangement, the driver has the road illuminated in front of him when he responds to the dimming signal of an approaching driver, giving him full vision ahead without danger or discomfiture. This is accomplished by rotating the right-hand lens nine degrees in the proper direction to give a low light on the left and a high light on the right, and the mounting of a special switch for heavily dimming the left hand light. Thus, when two cars equipped with this system approach one another with their left lights dimmed there is plenty of light on both sides of the roads furnished by the two right lamps. Over 50 per cent of the glare is reduced with this arrangement, it is claimed. It was also suggested by Mr. Crane that to prevent the direct rays from the filament striking the eyes the conventional type of bulb should be frosted in front. A bulb of this type was demonstrated.

Old Cars Give Most Trouble

Most of the glare, Mr. Crane stated, results from lamps being out of adjustment, which is more often the case on cars which are older than one year and which have been subjected to hard usage or damage. At this stage the car owner, as long as there is sufficient light for driving, does not worry about the condition of his lamps and there is necessity for strict enforcement of the law (which, incidentally, is in effect in only five states) to curb those whose lights are objectionable.

Mr. Crane demonstrated the practicability of his scheme by having two automobiles, one mounting the conventional lamps and the other the suggested type, facing each other in the room. The device is said to cost no more than the simplest forms of headlighting now employed. Furthermore, it is possible to install the system on any car in operation.

Between the reading of the paper and the discussion following, members were permitted to see for themselves the effect of the device by sitting in the facing cars while the room was darkened. It was obvious that if such an arrangement were in universal use the objections to night driving would be greatly reduced.

Several persons prominent in the lamp and bulb industries as well as the representatives of automobile companies, including the Ford Motor Co. and the Studebaker Corp., participated in the lively discussions. Generally, Mr. Crane's idea was upheld as being a promising development and an improvement over other types of headlight control.

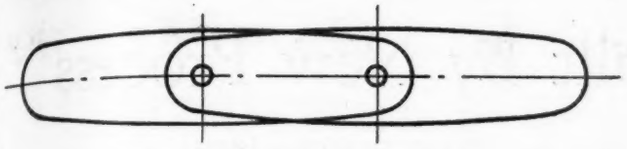
From the viewpoint of a manufacturer, C. E. Godley of the Edmunds & Jones Co., said the lamp industry is willing to construct anything the public wants and the car manufacturer cares to install. Therefore, they are watching closely any new developments. Godley in endorsing Crane's idea and pointing out the value of the scheme for use on old cars, stated he had conducted similar experiments ten years ago.

Favor Better Legislation

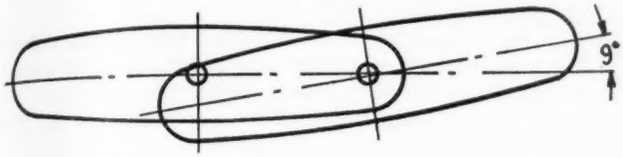
P. E. Wagner, of the Studebaker Corp., mentioned the difficulty of keeping headlamps in proper adjustment after the cars have been in service for a long period. Even when lamps have been carefully adjusted, one automobile backing into another when parking, etc., and slightly damaging the fenders, may distort the beams and cause glare. Wagner referred to Crane's device in complimentary terms, but it was his opinion that legislation is necessary to rid the highways of objectionable headlights.

The demonstration of Mr. Crane's device was seen as an improvement by J. H. Hunt of the General Motors Corp., who claimed to have experimented along the same lines ten years ago. He said that from his observations the majority of drivers are willing to dim.

The frosted bulbs referred to by Mr. Crane were the object of an attack by T. J. Litle of the Lincoln Division Ford Motor Co., who stated frosted bulbs were used on the 1919 model Ford cars and were standard only for one year, as they were not considered good enough for Fords. He was surprised that people would be likely to adopt them again six years later. According to his observations, headlight conditions were exceptionally bad in the State of Michigan, where there is no law enforcement. In Massachusetts, Nebraska, California, Connecticut and New York, where there are headlight laws, conditions are better. People fail to dim because of the effort required, Litle said, as on a long night drive it is necessary to switch the lights on and off some three or four hundred times. It would be an easier matter, he thought, to train people



Standard headlight adjustment



Proposed headlight adjustment, produced by rotating lens or mirror 9 deg. in right-hand headlight

to visit inspection and adjusting stations periodically than to get them to constantly dim their lights.

I. H. Door, in backing Mr. Crane's idea, said what is needed is a dimming device which will fit into any headlight and use present bulb styles. The frosted type of bulb, he said, was bad in fog and does not eliminate glare. Instead of giving more light ahead he suggested that greater lateral light be allowed, so that the gutter, sides of road and sign posts could be more easily read. The parabolic reflector must be abandoned and something else developed and Mr. Door gave the following specifications of an ideal form of lamp: No glare, illumination 200 to 300 ft. ahead, non-focusing, easy door removal, and a generous light depth, with more light at right angles and to the rear, so that in the event of one light being extinguished the automobile would not be mistaken for a motorcycle. Mr. Door said that with a simple foolproof adjustment there should be no excuse for non-compliance with the laws.

The Two-Filament Bulb

More progress has been made recently than ever before in efforts to eliminate glare, said R. N. Falge of the National Lamp Works. The greatest development was the advent of the two-filament bulb. So far only two large manufacturers have adopted this type of bulb but he said that there will positively be over a dozen different makes of cars so equipped at the National Automobile Shows. This type of bulb can be constructed by any manufacturer and is not limited to Mazda control. Over 5 per cent of the light from the filament is reflected back from the inside front surface of the bulb, and corrugated circles at the front of the bulbs have done much to lessen this glare.

L. C. Porter, S. A. E. Headlights Committee, in concluding the discussions repeated a statement made several times before that a lot of the glare trouble comes from cars which have been in service for a long time. He said emphatically that the car manufacturers themselves can do the most of all to lessen glare by making all parts connected with the headlamps of substantially stronger materials so that it will be difficult for the lamps to get out of adjustment through constant usage or slight damage to the car. It is his belief that the public is willing to pay more in order to secure better lighting conditions; that the tilting type of beam is likely to come into its own. He endorsed the S. A. E. specifications and urged the manufacturers present to put stronger materials into their headlamp mountings.

In his paper Mr. Crane said that the system described by him as applied so far required only standard equipment already on a car. The equipment consists of headlamps having parabolic reflectors and equipped with Bausch & Lomb lenses. These headlamps are mounted about 36 in. above the road surface and are adjusted at the present time with possibly a dip of 4 in. at 25 ft. City driving or parking is provided for by low candlepower bulbs in the main headlight reflectors.

To change this arrangement over to the new system, the lens in the righthand headlight was rotated about 9 deg. in the proper direction to lower the left-hand end of the projected beam and to raise the right-hand end.

A separate switch was then provided to permit of extinguishing the left-hand headlight alone. With the left-hand headlight extinguished the regular city driving light furnishes a marker light for the left hand side of the car. When two cars equipped with this system approach each other the left-hand headlight in each case is either extinguished as described or else heavily dimmed, no change being made in either the intensity or direction of the right-hand light, the result being that the passing light on the right-hand side of the road of each car is maintained at maximum intensity while illumination on the left-hand side of the road is in each case furnished by the approaching car.

Glare Reduced 50 Per Cent

This arrangement reduces the glare effect at least 50 per cent even under the best conditions, and much more under conditions of rough road surface or heavy crowning. It also greatly reduces the reflected glare from wet pavements, which is a serious objection to the tilting beam type of headlight control.

A very noticeable point with a car having this arrangement is that the extinguishing of the left-hand headlight produces no observable decrease in illumination when another car is approaching. In other words, the light from this lamp under normal conditions is being thrown on a part of the road already lighted by the approaching car and gives no useful result in illumination to offset any glare produced by it. At the same time the right-hand headlight, due to the angular position of the beam, rarely throws any blinding rays above the wheel hub of an approaching vehicle, while at the same time maintaining a long distance beam on the right-hand side of the road, where it is most necessary.

A legitimate question will be raised by those who have not tried this arrangement, as to the objectionable effect of the raised beam on the right-hand side when cars are approaching on a curve. Of course, no difficulty can arise from a car on the outside of the turn, but the light from the car on the inside can, under conceiveable conditions, reach the height of a driver's eyes. This occurs only at considerable distance and when the driver who would be discommoded is looking in an entirely different direction.

Turns Affect the Beams

Where turns are banked, either over the whole road surface or due to crowning of the road, the rise of the right-hand beam is almost entirely nullified. It is not certain that the exact arrangement described, especially as to the direction of the beams, is the best possible.

The system just described is open to one objection and that is the necessity for some control over the direction of headlight beams of considerable power. It is true that this control need not be nearly as accurate as is required by the old fixed beam system, but to get satisfactory results with this or any similar system we must have full cooperation by car users, either voluntarily or under the stress of rigid enforcement. In the lower priced field, especially in the case of second-hand cars, a tremendous problem exists for any officers attempting to enforce a headlight law. For this reason the use of a diffused light produced by large diameter frosted bulbs on cars of low price and presumably moderate speed, was suggested.

Tubular Radiators Built by New Process

Process developed in Germany said to be more economical than any now in use. Production cost is cut more than 60 per cent.

WHAT is claimed to be a more economical method of manufacturing tubular radiators in quantity than any now in use has been developed in Germany by Ernst Grospietsch, of Berlin.

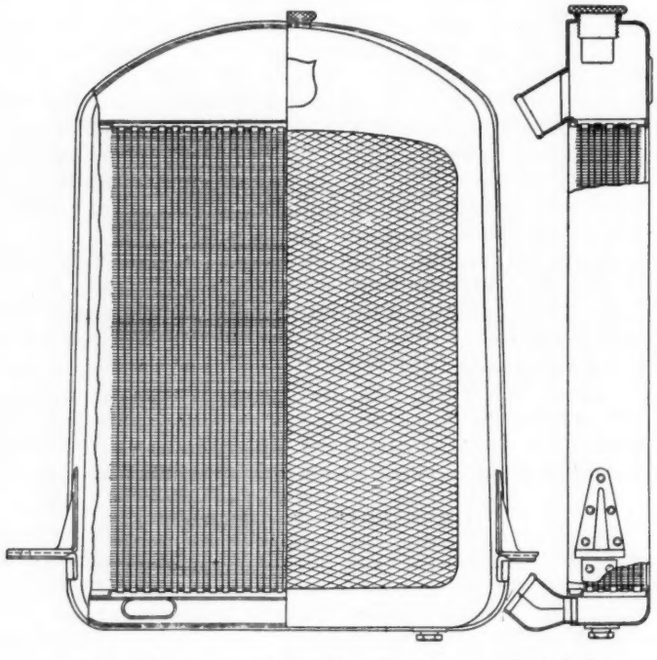
The tubular radiator is largely used on trucks and tractors because of its ability to stand up under severe vibration. This type of radiator could be used also for passenger cars, but in the past its appearance has kept it out of this field. Even when in perfect shape the tubular type is not as attractive as the cellular core, and a still greater handicap has been that a slight shock will bend the light fins and mar the core. The process of radiator production referred to has been adopted by the Brennabor Works of Brandenburg. This concern, we are informed, cut its cost of production by more than 60 per cent by the adoption of the system.

In order to improve the appearance of the core the forward row of tubes is provided with fins of a special pattern, which makes the core look like a cellular type, the tubes being hidden from view. The process of manufacturing these cores is briefly as follows:

The tubes are made from copper strip which, in a special machine, is formed into a tube with a seam on the inside, as shown in one of the illustrations herewith. The seam is automatically soldered. Before being put into this machine the copper strip is automatically tinned on one side in another machine.

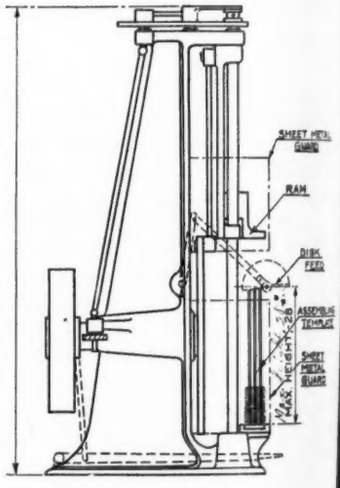
Next the tube is cut off to the proper lengths and in the following operation the fins are slipped over the tube, this being accomplished semi-automatically. The assembled core is placed in an oven, the temperature within which is kept at such a point that the seam is automatically soldered and the fins are soldered to the tube. This gives a metallic connection between tube and fin which facilitates the heat flow, and the amount of solder required is said to be much less than with the old method of dipping. After this soldering process the core is tested and is then ready for assembling into the frame.

We are indebted for the above information to Axel Jansson of the International Motor Co., New York.

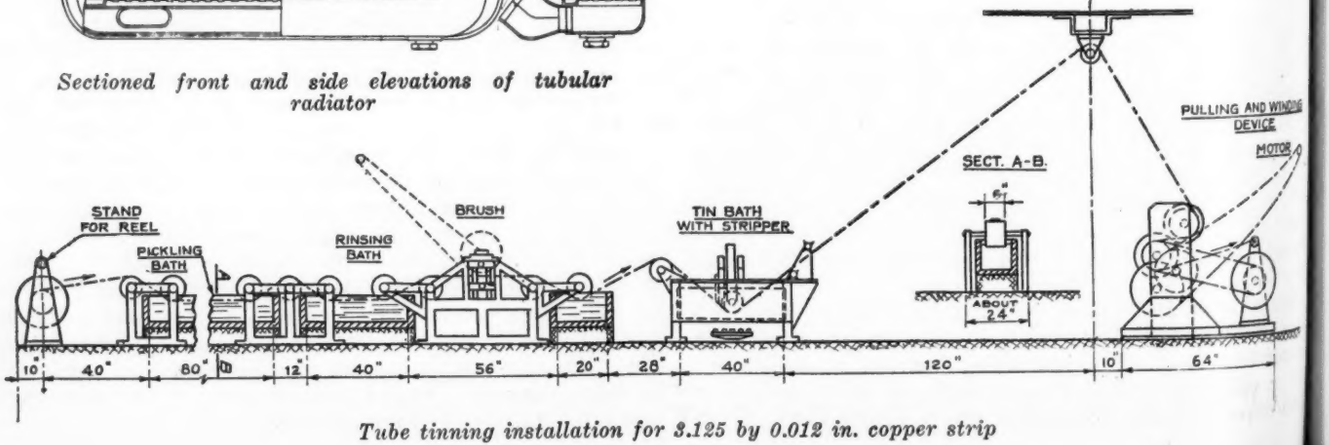


Sectioned front and side elevations of tubular radiator

Section through tube with inside seam.



Tube assembling machine



Tube tinning installation for 3.125 by 0.012 in. copper strip

Chromium Plating is Brought Down to Commercial Basis

Process is worked out by Vacuum Can Co. whereby surface coating one-fourteen-thousandth of an inch thick is applied to ferrous metal parts to increase resistance to heat, wear and corrosion.

By A. H. Packer

FOR a number of years it has been recognized that the extraordinary hardness of chromium would render the metal of great value if it could be applied to the surfaces of various mechanical parts in the case of which surface durability is an important consideration. Until recently, however, chromium plating was not a practical process, and the properties of the metal were taken advantage of chiefly by using it as an alloying element. Some armor plate, for instance, contains a large percentage of chromium, while the steel used in certain crankshafts and in the majority of rear axle shafts is a nickel chromium alloy steel.

Intense development work on chromium plating has been going on for some time both here and abroad, and one such process has been brought to the commercial state by the Vacuum Can Co. of Chicago. A large number of items are said to be now going through the plant of this concern, while its metallurgical staff is working on further applications of the process.

Among the valuable features of a surface coating of chromium are great resistance to wear, due to its unusual hardness, a high melting point, extreme flexibility and ability to adhere to the base metal. A very thin coating can be used, which is an advantage under certain conditions. For instance, parts can be machined to finish size and then be plated without changing their size enough to be detected with ordinary measuring instruments, as the normal coating is only 0.00007 or 1/14,000 in. thick. The chromium is said to resist corrosive influences much better than nickel, but the cost of chromium plating is higher. A number of manufacturers in the automotive field are interesting themselves in this new plating process, although most of the work that has been done so far has been ir other lines.

Used on Pilot Light Unit

One oil burner concern, for example, used a chromium plated pilot light unit, and found it outlasted by far a similar unit which was not plated. The high melting point of chromium of over 3000 deg. accounts for its ability to resist heat. Even a thin coating of the metal is said to raise by several hundred degrees the temperature which the part can successfully stand.

This property makes it valuable on parts such as poppet valves, which are subject to flaking and disintegration under the oxidizing action of the exhaust gasses. The process has also been applied experimentally to pistons, piston rings and cylinder walls where the ability of chromium to resist heat, corrosion and wear is expected to vastly increase the life of such parts.

Resistance to wear is accounted for not only by the hardness of the surface but also by the extreme smoothness of the material. A mere wash of the material gives a bright surface similar to nickel plating, without the necessity of buffing, but this extremely thin wash is not so durable as a more dense coating. The thin bright layer under the microscope also presents a rougher structure, similar to the grain in a steel bar,

As the plating process continues, however, the piece loses its gloss and the coating takes on a dull gray hue. At the same time the aspect under the microscope also changes. The grain disappears and the surface becomes smooth and quite similar in appearance as when seen with the naked eye. In this condition it is adaptable to all parts which must resist wear, while buffing gives a finish similar to that of a buffed nickel-plated surface, but much more durable, to judge by the salt spray test, as outlined in Circular No. 80 of the Bureau of Standards.

Will Not Scale Off

A representative of *Automotive Industries* had the opportunity of examining a piece of copper wire which had been chromium plated. This was bent back and forth slowly until the wire broke, but at no time was there any indication that the plating had loosened from the wire. In fact, the cromium is said to alloy with the material beneath, making with the core a single piece of metal.

A piece of steel was also seen which had been coated and then heated to a high temperature until discolored. It was then buffed and tested with sodium ferrocyanide, which detects imperfections in plating by the formation of a blue precipitate at any point where the iron is exposed. The piece was again heated, buffed and tested, and the same process repeated for the third time, without showing any point where the iron was not covered by the chromium coating.

Another example indicating the possibilities of this process was a piece of seamless steel tubing approximately ¾ in. in diameter and three feet long, which had been plated both inside and out. After plating, sections were cut from one side of the tube to show the perfection of the plating on the interior surface. A job of this sort is not a simple one, however, for it is necessary to run a long anode through the tube to insure an even coating on the inside, while some method of circulating the solution through the tube is also required.

Pieces having peculiar shapes are also more expensive to plate, for specially shaped anodes are often needed. A case in point is that of a double venturi used in a steam jet, which necessitated the use of a specially shaped anode so as to equalize the distance which the current must flow through the solution between the anode and the work at all parts of the surface of the latter.

While the process itself cannot compete with nickel on

a cost basis, there are many instances where its use will cut down the total expense of a part. Where unusual requirements with respect to resistance to the effects of heat and corrosive agencies have made it necessary that a part be manufactured from some expensive non-ferrous alloy, it is often found that chromium plated steel can be used as well. This holds particularly where extreme accuracy of the parts is required, as in that case the rejection of defective parts constitutes a heavy item of expense due to the high metal cost. The same number of rejected parts made of the cheaper metal would not be much of an item, while the plating over the base metal would give the same service characteristics.

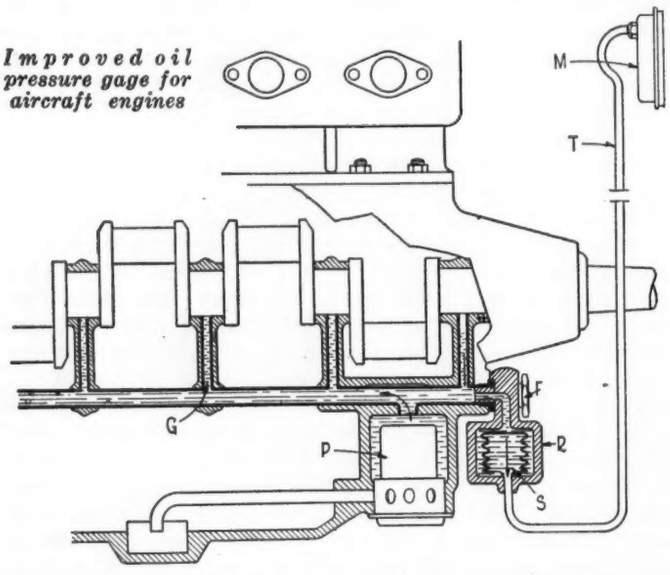
It may be found that on the higher grades of car the somewhat higher cost of the chromium plating process will not stand in the way of its application to parts which are merely exposed to the weather, as the chromium plate will not crack and peel and will strongly resist the formation of rust, due to its density and firm bond with the base metal.

Amyot Oil Pressure Indicator

THERE are two objections to the conventional method of measuring the pressure of the circulating oil in an aircraft engine by direct connection to a pressure gage on the instrument board in the cockpit. One is that in extremely cold weather (or at high altitudes) the oil in the line to the gage will congeal and the latter will not indicate. The other is that in case of a leak in the tube to the gage all of the oil in the engine may be lost.

These difficulties are overcome in the Amyot oil pressure indicator, which has been developed in France. This comprises a pressure relay which is secured directly to the engine crankcase and communicates with the oil

Improved oil pressure gage for aircraft engines

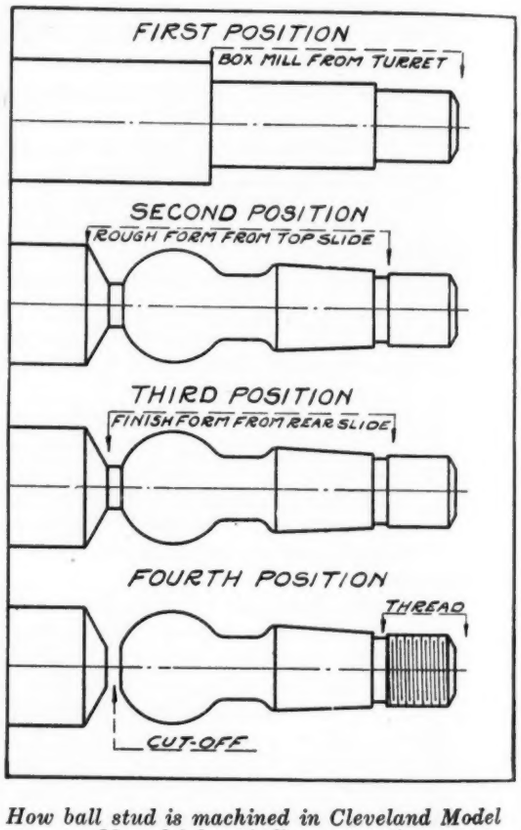


pressure line. The relay consists of a chamber of duralumin which is capable of withstanding any accidental excess pressure that may develop. Inside this chamber is located a metallic bellows (sylphon), which is filled with a non-freezing fluid. Being utilized merely for separating the two fluids, there is no difference in pressure on opposite sides of the wall of the bellows, and in spite of the very thin material of the wall it cannot be injured, it is claimed.

Should the tube leading to the gage become broken, only the fluid in the bellows and the tube will be lost. The bellows will be compressed solid under the pressure of the oil in the lubricating system, which obturates the outlet from the duralumin chamber and prevents the loss of oil. Since the non-freezing liquid is very fluid even in extreme cold, a capillary tube may be used for carrying it to the gage, which can be protected over its whole length by a steel sheath. The small diameter of the tube makes it very flexible, which is quite an advantage on an airplane.

Machining a Ball Stud

THE accompanying illustration shows how a ball stud, as used for drag link connections, etc., is machined in the Cleveland Model M multiple spindle automatic. The stud is machined from round stock, and



How ball stud is machined in Cleveland Model M multiple spindle automatic

in the first position the bar is box-milled to the diameter of the threaded portion at the end and to a somewhat larger diameter up to the ball, these box milling operations being performed from the turret.

In the second position the stud is rough formed from the top slide and in the third position it is finish formed from the rear slide. In the fourth position the thread is cut from the turret and the stud cut off from one of the slides.

CIRCULAR of the Bureau of Standards No. 276 deals with Motor Vehicle Headlighting. The Bureau for several years has been cooperating with engineering societies and other agencies interested in improved headlighting for motor vehicles. This work has been in charge of R. E. Carlson, mechanical engineer, who is the author of the circular. The general principles of headlighting are outlined, and directions are given for adjusting the headlights. The circular also contains the approved list of headlamp devices of the Eastern Conference of Motor Vehicle Administrators.

Recent Developments in British Automotive Design — *Part 2*

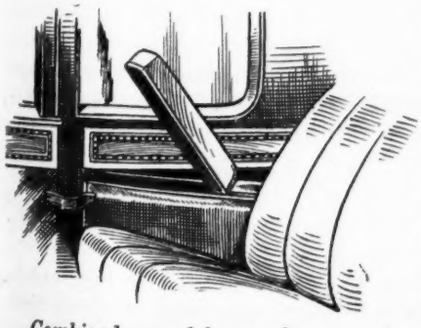
Adjustable front seats are popular. Use of disappearing side windows increase. Higher body side, wide seats and pyroxylin finishes are much in evidence

By M. W. Bourdon

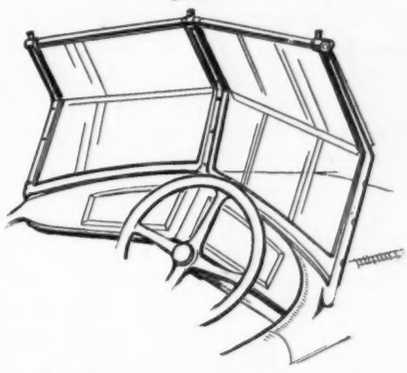
IN last week's *Automotive Industries* Mr. Bourdon wrote of chassis and engine developments in British automotive practice, as shown in the cars exhibited at Olympia. The article concluded with a general resume of changes in body design and construction which have been introduced since the last Olympia. The present article continues this subject with a detailed discussion of how British manufacturers are trying to give their public what it wants in the way of motor car bodies.

A NEW scheme of front seat arrangement is used in the Hillman Fourteen, a new four-cylinder model. In this case the front seat framing—base and back—is a fixture, but the back cushion on a frame is fixed to the seat frame along its top edge only, while the cushion, also on a frame of its own, is adjustable fore and aft on the seat base; adjustment of the seat cushion position varies the angle of the back cushion, the two being coupled by large hooks of flat steel on the cushion frame. This arrangement affords rake adjustment rather than leg-reach adjustment, though the latter is shortened as the back cushion angle is increased.

Open car bodies are tending to become semi-rotund in outline viewed from front and rear, the door and side panels having slightly more curvature. Another trend is towards the elimination of the top edge moulding, the panels being continued over to the inner face of the door and body frames. On open cars rear shields are provided less frequently than they were last year, but considerable improvement is evident in side shields. The latter are much neater, some having little if any fabric edgings, and are more rigid when used with the top folded. The system of stitching the celluloid to the fabric covering of the metal frame is disappearing; now it is either held by rivets in a light metal frame of channel section, the rivets also passing through an inner framing of round section steel, the ends of which are bent down to form pegs to drop into sockets on the top edges of the body, or where narrow fabric flaps are required to prevent draughts and allow for discrepancies in body dimensions, the edges of the celluloid and the fabric are held in a light metal frame of S section, compressed after the celluloid panels and edgings have been inserted in the channels. The corners of the frames can be rolled to quite a small radius, though cut and riveted corners are needed if they must be quite square. The panels thus formed are riveted to inner frames of D section steel with projecting ends to form pegs. To allow for variations in peg centers, some body makers are using a form of socket with a rotating winged sleeve in which the hole is eccentric.



Combined parcel box and arm rest on Morrison Oxford sedan



Driving shield on Rhode light car; forward inclination of lower section is raised to reduce draft

There are indications, however, that the detachable type of side shield will be superseded on medium-priced cars by others of a "disappearing" type. The Humber arrangement, which appeared on the 15-40 hp. model last year has been adopted for the smaller car of the same make, and the example thus afforded has taken other forms in other makes. Standard, for example, in the 14 hp. open car has drop windows of celluloid in light aluminum frames that can be lowered by means of mechanical regulators of the type used in sedans. Austin, for the 20 hp. model, has side shields like the Humber, but one half of each divided panel is hinged along the inner edge of the door and can be swung inward when taken out of use, falling inside the door, there protected and concealed by a stiffened leather flap hinged along its bottom edge; behind the rear door is a fixed pillar supporting the quarter lights.

A third arrangement consists of panels of glass fixed to the front door tops—or capable of being lowered into the doors—and a three-panel glass unit at the back supported by a pillar just behind the rear door; two of the three rear panels are in front of the pillar, hinged to the latter on the same vertical axis as the door hinges, and hinged vertically to one another. Those two panels can be clipped to the rear door, to open with it and join up with the front panel; alternatively, they can be used as half of a transverse rear shield, or swung back as a folded unit outside the rear section, behind the pillar. In another case there is a permanently fixed glass panel over each front door, while pegged-in celluloid shields are fitted behind.

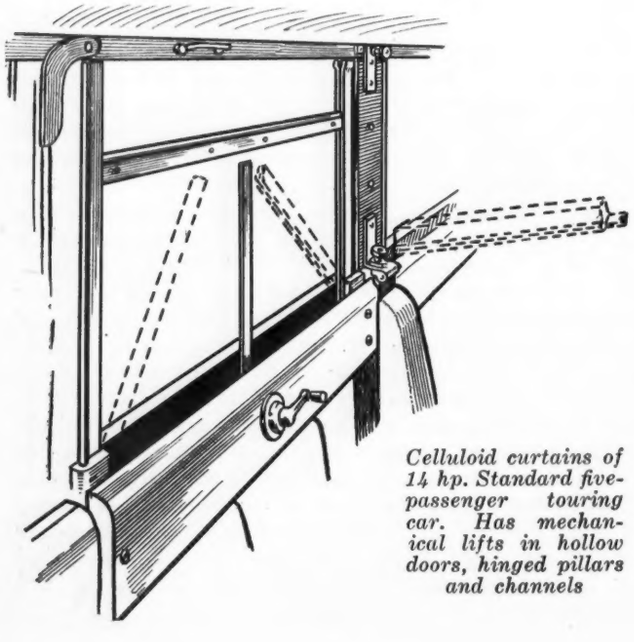
Many small open bodies have higher sides than hitherto, and there is evident a tendency to increase the wheelbase and track by two or three inches to give roomier four-passenger accommodation; in a few instances the engine bore has been increased by two or three millimetres to cope with the additional chassis and body weight.

There are cases of greater width being given to the rear seats of small sedans by providing wheel housings. Morris does this, and provides a combined arm rest and glove box over the wheel arch. The actual cushion width is often the same as before, but its effective width is greater, because of the added elbow room.

In seven-passenger cars, the auxiliary seats frequently fold flush into recesses in the front seat back; a development in this connection is provision of "toe-space" under front seat base, which, with the recess above, affords from 8 to 12 in. extra room if the auxiliary seats face forward.

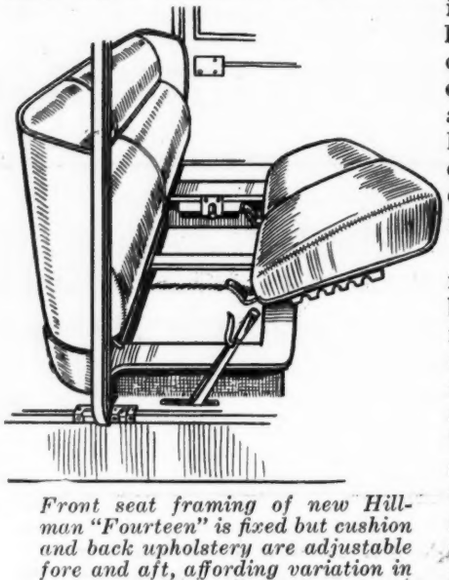
Two-compartment sedans—in America limousines—are increasing in favor on the larger chassis models, though this infers a fixed front seat to carry the drop or sliding glass division. Saloon landaulets are also increasing in popularity but all have concealed landau irons. Sedans with six side windows are general, but not often can the quarter window on each side be lowered; sometimes sliding half-glasses appear there, but fixed quarter windows are the rule. Morris on the £235 Cowley model six-light sedan (the smaller and cheaper chassis with a 94 cu. in. engine and 102 in. wheelbase) fits two doors on the left and none on the right; four drop windows have mechanical regulators, two windows being fixed.

Spring-lift windows are rare. The usual regulator is of the endless chain type, but some makers use a lift-and-lower lever device with a double ratchet.



Celluloid curtains of 14 hp. Standard five-passenger touring car. Has mechanical lifts in hollow doors, hinged pillars and channels

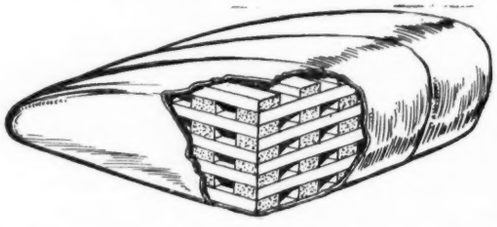
The separate and adjustable seat has appeared on coupe and even on roadster bodies. Sometimes the two seats are staggered, with a locker behind the driver; in other cases they are in line, with a full-width locker at the rear inside the folded head. Fixed-head coupes are more in evidence. Comparatively few coupes have quarter windows; with wide doors these are not needed.



Front seat framing of new Hillman "Fourteen" is fixed but cushion and back upholstery are adjustable fore and aft, affording variation in angle of seat

As regards finishes, one-color bodies without lining or belt are general, with black fenders and axles and colored wheels. The most prevalent standard colors are fawn, mole, brown, grey, maroon and dark blue. Leather upholstery for sedans and also for other types of closed bodies is increasing.

British makers at Olympia show lacquer-finished cars for the first time; but none have an actually dull finish, though all except five or six cars are below varnish in their standard of lustre. The exceptions are two Rover cars with a gloss rendering them indistinguishable from the varnished cars on the same stand, two Rileys and a Hillman.



Upholstery cushion of spongy rubber introduced at Olympia

The last three cars are finished by a process termed Celvalac, an after-treatment of sprayed lacquer, with pigment, which quickly gives the coatings a high gloss. The Hillman example is the most striking, because alongside is an almost identical car of the same make, model and color, but painted and varnished; the writer went from one to the other several times before he could identify the lacquered body and only did so by noting a few dust specks in the finish of what he then assumed (and confirmed later) to be the varnished car.

That lacquered body was said to have been finished as shown in six man-hours from the bare metal; one priming coat, stopping, rubbing down, three sprayed color coats and finishing. The process consists of securing a polish by a paste comprising a very fine abrasive and a chemical (undivulged) which accelerates the action of the abrasive. No wax is used. The patent rights of this process have been secured by a prominent British firm of celluloid manufacturers. It is claimed to be cheaper, not only than paint and varnish, but also than the usual dull lacquer finish, owing to the leveling action of the after-treatment rendering unnecessary so much care as usual in stopping and filling. Any color can be used.

This Celvalac process, it may be added, was referred to in *Automotive Industries* of July 24, 1924, at which time its originator had applied it only to the mahogany, walnut and other natural-wood fittings of high-grade cars.

EDITORIAL

Down It Goes!

A BREAK in motor stocks came on Tuesday, Nov. 10. Many other stocks toppled from peak positions as well, following announcement by the Federal Reserve Bank of Boston of an increase in the discount rate.

The collapse of the market was dramatic and sudden. But the drastic change was not predicated on any new information concerning basic industrial trends. It cannot in any sense be looked upon as a Wall Street prediction that business is due for a slump.

A pertinent summary is that of the Philadelphia *Public Ledger* which says that the market fall "was started by professional speculators for the decline. In many quarters the drastic shake-out was regarded as an overdue correction of a weakened technical condition arising out of recent speculative excesses in a number of high priced stocks. It was generally agreed that the decline will have a sobering effect on small speculators who have been inclined to reckless trading."

Men close to the automotive industry have felt throughout the period of unusually high stock prices that many of the peaks reached were by no means justified by basic trends in the industry. These same men are likely to feel little perturbation on account of the current decline, which has far less meaning to the industry as a whole than to individual speculators.

The New Record

OCTOBER motor vehicle production totaled 454,000. That was a new monthly record.

The figures were announced over a week ago, but the industry will be talking about them for a lot longer than that. The total is staggering, not only because of its size, but also because of the time of year at which it appeared. October, the month in which "the regular seasonal decline begins," this year established a new high point.

What's the answer?

A single factor is largely responsible for the record. Ford ran into difficulties getting into production on his new closed models a month or so ago. He got into his stride again in October and crammed into that month the production of many cars which under other circumstances would have been built during August and September. Realization of that fact takes away some of the breath-snatching qualities of the huge total.

But manufacturers outside of Ford did exceptionally well, also. Following preliminary reports that production by N. A. C. C. members for October would be some 10 to 15 per cent lower than in September, this group came through with the largest production of the year. It is believed that good export business was a factor in keeping up the output, while the elements of unusually low prices and relatively good weather in certain parts of the country undoubtedly influenced sales favorably in many areas.

Christmas Sales Punch

DECEMBER has been an off month for automobile sales for so many years that low production and curtailed retail selling has almost become an accepted fact.

There are plenty of reasons for this condition. Almost anybody in the industry can give off hand a list of twenty whys and wherefores for small December business.

But it's not a good thing ever to accept as inevitable an unfavorable condition. Hard thinking and strenuous effort, if combined, often can make two blades of grass grow where one grew before. The advent of the closed car alone did much to improve fall and winter sales of automobiles. The closed car didn't remove the variations, but it did minimize them.

Maybe something can be done about December sales.

Hundreds of other industries profit more in December than in any other single month. They take advantage of Christmas desires and Christmas spirit. Automobiles never have been put into the Christmas picture as they might be. In specific instances, strong efforts along this line have been made, but on the whole the automobile as a factor in Christmas buying hasn't had the recognition it might have.

Capacity and Demand

THERE isn't going to be any smaller gap between actual production and production capacity in the automotive industry at the end of 1925, despite the 4,200,000 or more production which now seems certain to be rolled before January 1, 1926.

On the basis of incomplete returns, we are willing to guess that the industry at the end of this year will have facilities capable of building at least 600,000 more motor vehicles than at the end of 1924. Yet sales this year will have gone ahead of the 1924 total only by about 550,000, leaving an excess of at least 50,000 in capacity in addition to the 2,000,000 excess which already existed at the beginning of this year.

Capacity and demand never will be equal. Such a condition is neither possible nor desirable. Ability to produce always must exceed average demand in order that the inevitable peaks in sales may be taken care of with some degree of adequacy. The only question which arises is, "How great a difference between capacity and demand can exist and still permit profits to the industry?"

Our Industry Today

High Production Due to Effort to Catch Up With Surplus Orders

NEW YORK, Nov. 12—The record production last month of approximately 454,000 cars and trucks in the United States and Canada was made in the face of a declining volume of new orders. It therefore represented to a great extent the effort of manufacturers such as Ford to catch up with a large surplus of orders already on the books. Furthermore, the decline in new orders was not very great, and still left the volume far ahead of normal for this time of year.

At the present output rate, which is being slackened only very gradually, a surplus of roughly half a million cars will be carried over into the new year by distributors and dealers. This may sound like a large number, but it actually represents only about ten cars per dealer—no more than sound business principles would indicate as the normal stock to be laid by during the slack season. On the other hand, it will tie up about $400,000,000 in credit, an important sum should there be any period of serious credit strain.

Export Outlook Good

A constantly expanding export market is perhaps the brightest spot in the automotive picture. Over 15 per cent of current production is going overseas and there are indications that the goal set by the automobile manufacturers—25 per cent of total output for export—may have been too conservative. Germany, with the abandonment of drastic restrictions on automotive imports, has become an important market, and cars are flowing into that country at an astonishing rate.

The total production of cars and trucks for 1925 will be from 4,200,000 to 4,400,000, or a new high record for the industry. Fourth quarter earnings should be little, if any, lower than those of the third quarter. The outlook for 1926 is favorable, with a fair prospect of a lowering or elimination of the automotive excise taxes, and with other economies to the purchaser in the form of lower insurance and financing rates. The incentive to buy will be greater than ever before.

Engineers in National Traffic Safety Drive

NEW YORK, Nov. 10—Organization of a Nation-wide movement among engineers to solve the traffic problem is announced by the American Engineering Council. The work will be carried on by the Council's 30 National and local societies in co-operation with other agencies, according to the president, James Hartness. Among the assisting societies is the American Society of Mechanical Engineers.

House Committee Favors 50% Tax Cut

Will Recommend Truck and Parts Impost Off, and Car Tax Reduced From 5 to 3%

WASHINGTON, Nov. 10—Repeal of the 2½ per cent tax on trucks, tires, parts and accessories, and reduction of the tax on passenger automobiles from 5 per cent to 3 per cent was definitely decided upon today by the House Ways and Means Committee.

The action of the committee will result in a saving to truck users of approximately $7,800,000 next year, and to tire and accessory users of $22,737,000.

As a result of the reduction from 5 to 3 per cent on passenger cars, it will mean a saving of approximately $40,000,000 to passenger car purchasers.

Under the new schedule, the 1926 tax revision will mean roughly a reduction for the automotive industry of about 50 per cent. The automobile taxes of all kinds brought in $124,686,745 for the fiscal year 1925, and it was estimated that the 1926 tax would net the government about $141,000,000. Under the revised schedule, this would be cut in 1926 to about $71,000,000 for the automotive industry's share of excise taxes.

Bitter Fight in Committee

The section of the new tariff bill relating to automobile excise taxes was one of the bitterest fought out during the present hearings before the committee.

The automobile excise discussion brought the first serious split between Republicans and Democrats over the issue. Garner (Democrat) of Texas, ranking minority member of the Committee, joined with the Republicans in voting down a proposal to repeal the entire automotive tax schedule. The fight was precipitated when Congressman Rainey of Illinois (Democrat) introduced a resolution to repeal the automotive taxes in full, declaring that the people would rather have the entire tax removed on automobiles than to have the exemptions increased. He declared that automobiles are no longer a luxury, that they fill a big place in the transportation service of the country, and must be considered as necessities of life. Losing his fight in the Committee, Rainey declares that he will carry it to the floor of the House.

Lord Urges Periodic Maintenance Service

Competent Men of the Industry Give Advice at Service Engineering Meeting

CHICAGO, Nov. 11—Establishment of periodic maintenance service, which would have for its objective the prevention of trouble, was urged as an essential feature of an automotive transportation system by G. Frank Lord, Durant Motors, Inc., speaking before the opening session of the Service Engineering Meeting being held here under the joint auspices of the N. A. C. C. and S. A. E. Such service, he said, would make car ownership more satisfactory and less expensive, and would also assist dealers in maintaining shop sales.

In his paper on designing with consideration for the repairman's tool equipment, D. C. Hinkley, of the Hinkley, Myers Co., pointed out that this factor was frequently overlooked, and that, in many cases, dealers could be saved a considerable investment in tools without affecting the quality of the car or increasing its cost of production.

Methods to Prevent Corrosion

Corrosion in International combustion engines was covered in papers by Frank Jardine, of the Aluminum Co. of America, and M. A. Thorne, of the Tidewater Oil Co. Among the methods suggested by Messrs. Jardine and Thorne for preventing such corrosion, were the reduction of the warming-up period, crankcase ventilation, better fitting pistons, and the provision of an adequate supply of oil to bearing surfaces as soon as the engine starts.

"Trouble Diagnosis" was the topic at the Tuesday morning session. An outline of the procedure to be followed in locating the trouble was presented by J. C. Talcott, Pierce-Arrow Motor Car Co. The experience of the Chrysler Corp. in building an organization to service its product was described in a joint paper by John Squires and Carl Breer, of the Chrysler Service Department. Frederick Alberty discussed the effect on engine performance of leakages past the valve stems, and recommended the use of packing at this point. Another paper on the subject of "Trouble Shooting" was presented by F. E. Edwards.

(Continued on page 841)

A.E.A. Groups Give Approval to Merger

Spirit of Optimism Pervades Convention — Improved Business Ahead

CHICAGO, Nov. 11—Midweek of the Seventh Annual Show and the Tenth Annual Convention of the Automotive Equipment Association finds the branch of the industry represented by the makers and wholesale distributors of accessories equipment and parts reviewing a year that has been generally successful for them, and making plans for bigger business next year.

A total of 225 exhibitors occupy all the available ground floor space in the main Coliseum Hall and its two annexes on the North and South. Many exhibitors have taken greater space than ever before. As usual, a number of exhibitors have chosen this show as the place for announcing new products. Thus far, more than 100 items of new merchandise have been displayed to show visitors.

Primarily a Business Show

There will probably not be any attendance records broken, for admission to the show is carefully controlled by the management so that only members of the association, their employes and invited guests are permitted to view the exhibit. It thus becomes primarily a business show, and not one for the general public.

At the first session of the convention, forty new members were admitted. At later divisional sessions, the proposed consolidation of the A. E. A. with the Motor & Accessory Manufacturers Association was approved by both jobbers and manufacturers, and it is likely that at one of the general sessions, the board of directors will be authorized to consummate the consolidation.

S. A. E. Guests of A. E. A.

Wednesday morning at the regular session, service managers of car manufacturers and members of the Society of Automotive Engineers, who held a convention Monday and Tuesday at the Hotel La Salle, were guests of the A. E. A. at both the convention and the show.

A notable incident of the week was the annual dinner Tuesday evening of the Automotive Manufacturers Association, to which A. E. A. visitors were admitted. Attendance was in the neighborhood of 400. Features of the program were addresses by G. F. Disher, president, and Arthur H. Onthank, chief, domestic commerce division of the Bureau of Foreign and Domestic Commerce.

Delage Protests 91½-in. Race Rule

PARIS, Oct. 30 *(by mail)*—As a protest against the 91½-in. racing rule, which he considers has developed a dangerous and unsatisfactory type of car, Louis Delage stated yesterday that he would not compete in next year's French Grand Prix.

Delage states that he has not taken this decision because one of his drivers was killed this year, but in order to draw attention to the fact that modern racing cars are too fast for safety and no longer have any direct influence on automobile construction.

"There are not more than six drivers in the whole of Europe capable of handling a modern 122-in. racing car on the road at its maximum speed," says Delage. "As a consequence, victory merely goes to the best driver or the one willing to take the greatest chances. Because there is more power than the drivers dare use, the cars are no longer tested."

Overtime Prevails in Car Factories

WASHINGTON, Nov. 12—Telegraph reports on employment in the automobile industry, compiled by the U. S. Department of Labor and released today indicate a high state of activity.

Almost without exception, all automobile and accessory manufacturers are reported to be on an overtime basis. A slight let up in tire manufacturers' employment is indicated in spots, but as a whole many of the tire and rubber plants report full and overtime employment.

156 Parts Exhibitors at New York; 117 at Chicago

NEW YORK, Nov. 11—The accessory division of the National Automobile Show in New York will have on display the products of at least 156 accessory and parts manufacturers while 117 will exhibit at the Chicago show. These totals may be increased if additional space can be provided.

With the single exception of duPont Motors, listed only at New York, the same car makers will occupy spaces at both shows. Fifty will show here and 49 in Chicago, with eight makes of taxicabs at both shows. The divergence between the New York and Chicago accessory lists is considerable.

H. M. Robins Co. Adds Loomis and Matthews

DETROIT, Nov. 10—With the addition of W. D. Loomis, former export manager for the Gray Manufacturing Co., John Matthews, formerly of Dodge and Oakland, and E. V. Jolliffe, who has been connected with the sales development department of the Oakland Motor Car Co., the organization of the H. M. Robins Co., exporters, is about complete.

Charles A. Robertson, well-known in export circles, has charge of the European headquarters located at 63 Avenue des Champ Elysees, Paris. He installed the Ford plant at Cadiz, Spain, some years ago.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Nov. 10—Further gains in trade activity appeared last week together with more active buying and larger output in basic industrial lines. Business expansion was accompanied by continued strength in general commodity prices.

RETAIL STORE SALES

Sales at retail last month were considerably larger than those in October, 1924. F. W. Woolworth Co.'s sales totaled $22,989,166, as compared with $20,400,360 a year earlier, representing a gain of 12.6 per cent. The corresponding increase in sales of the S. S. Kresge Co. was 26.9 per cent; G. R. Kinney Co., 20.6 per cent; F. & W. Grand 5-10-25 Cents Stores, 33.5 per cent; Isaac Silver & Bros. Co., Inc., 38.3 per cent; J. C. Penney Co., Inc., 44.01 per cent; McCrory Stores Corporation, 29.9 per cent; Oppenheim Collins & Co., Inc., 20.63 per cent; Ginter Co., 16.02 per cent; S. H. Kress & Co., 10 per cent; and W. T. Grant Co., 29½ per cent.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks increased $65,900,000 in the week ended November 4, with gains of $46,300,000 in discounts, $13,700,000 in open market purchases and $5,500,000 in Government securities. Note circulation increased $18,700,000 and deposits $17,700,000, while reserves decreased $12,800,000. The reserve ratio declined from 72.5 to 71.5 per cent.

IRON AND STEEL

Pig iron production last month averaged 97,528 tons a day, as compared with 90,873 tons in September, and 79,907 in October, 1924. Daily average steel ingot output was 144,183 tons, against 134,342 tons a month earlier, and 115,365 a year earlier.

PRICE INDEXES

Fisher's index of wholesale commodity prices stood at 158.6 last week, as against 157.9 a week earlier. Both Dun's and Bradstreet's indices reflect an advance of 1¼ per cent during October.

COTTON CROP REPORT

The official cotton crop report, based on condition November 1, forecasts a yield of 15,386,000 bales, as compared with the preceding estimate of 15,226,000 bales.

CAR LOADINGS

Car loadings in the week ended October 24 numbered 1,121,459, comparing with 1,106,114 in the preceding week, and 1,112,345 a year ago.

MONEY

Money rates were not quotably changed last week, call loans ranging from 4½ to 5 per cent, time loans from 4¾ to 5 per cent and commercial paper from 4¼ to 4¾ per cent.

Automotive Steel Demand Maintained

Above Average for This Time of Year — Price Advance Due to Production Costs

NEW YORK, Nov. 12—With a $2 per ton advance in the quotation for cold-finished steel bars, which had been generally expected, virtually all descriptions of finished steel of interest to the automotive industries may be said to have gone to a price level approximately $2 @ $3 per ton higher than prevailed in mid-Summer. A considerable amount of automotive orders for cold-finished steel bars, as well as for cold-rolled strip steel, was booked by the mills immediately preceding announcement of the advance in these specialties, and current shipments are virtually all billed at the old prices. To what extent producers will be able to sweeten their average by working into their operating schedules fresh orders carrying the new price depends, of course, entirely upon the volume of new business. So far, there has been no indication of a startling broadening in the general industrial demand for steel.

Buying Brisker Than Usual

Automotive steel buying is of good proportion, commensurate with the somewhat brisker activity of consumers than is ordinarily the case at this time of the year.

What price advances have taken effect so far, are really not disturbing. They were largely warranted by reason of continuingly high, if not rising, production costs. It is, however, the cocksureness encountered, especially among the smaller producers, that the upward course of prices has only begun that is causing considerable uneasiness among consumers.

While the leading interest has so far at times led, but more frequently swam with the tide of price advances, it is safe to say that, as soon as the first breakers are in sight, its policy will be to guard against a falling off in the industrial demand by a reinstatement of its usual conservative policy when runaway market conditions threaten. The steel industry, all around, is reaping reasonable profits at prevailing price levels. Should they go sharply higher, there would be grave danger of a diminishing volume of orders. And this the steel industry can ill afford at this time.

The Metal Markets

Pig Iron—Blast furnace interests as well as melters are proceeding cautiously amid the general uncertainty of the outlook. It is not thought, however, that sudden ending of the coal strike and the ensuing decline in the price of coke would materially affect pig iron prices.

Aluminum — Market conditions continue unchanged with the sole domestic producer in absolute control of the situation and pursuing a far-sighted policy of holding the price of this metal as steady as possible.

Copper—The red metal is "touted" by Wall Street to be due for spectacular advances, but slow European demand tends to retard the upward movement. Automotive brasses are firm.

Tin—The market looks tired. Prices have been lifted as high as seems possible.

Lead—Famine prices continue, but it is thought that Australia will contribute somewhat larger tonnages to the world supply in future, thus relieving the world-wide scarcity of supplies.

Zinc—Producers ride a wave of unprecedented prosperity. Despite high prices, galvanizers are buying freely.

178,216 PERSONS IN FORD CO. EMPLOY

DETROIT, Nov. 10—Upwards of 178,216 persons are employed by the Ford Motor Co. in its various plants and branches throughout the United States, is was revealed at the company offices today.

Of this number, 70,682 are employed at the River Rouge plant and 51,533 at the parent plant at Highland Park. Some idea of how the Rouge plant has grown can be had when it is known that in May there were 3,000 less persons employed there than in the Highland Park plant.

Graham Bros. Output Gains 128 Per Cent

DETROIT, Nov. 10—Production of Graham Bros. trucks for the first nine months of 1925 exceeded the same period last year by 128 per cent, it was stated at the factory today. The 1923 figures were exceeded by 248 per cent.

These figures include the combined output of the factories at Detroit, Evansville, Stockton, and Toronto.

Hardwood Men Plan Standardization Saving

WASHINGTON, Nov. 10—A material saving will accrue to the automobile industry as a result of the action of the hardwood industry here this week in adopting plans for the elimination of waste and for standardization, according to Secretary Hoover, who has been instrumental in the lumber standardization movement.

"The automobile and the furniture industries will be the chief beneficiaries, so far as hardwood users are concerned," Secretary Hoover declared.

Decision to join the lumber standardization movement was voted on at Chicago, October 17, and ratified here this week by action of the National Hardwood Lumber Association and the Hardwood Manufacturers Institute.

Car Exports Down, Assembly Parts Up

Former Shows Decrease of 9,322 from August—Latter's Value Increases $1,000,000

WASHINGTON, Nov. 9—Decrease in actual motor vehicle exports from 37,683 passenger cars and trucks in August to 28,361 in September is reported by the Department of Commerce, which adds that the trade as a whole did not suffer to any great extent, since exports of assembly parts increased more than $1,000,000 in value.

Exports of all automotive products from the United States and Canada in September were valued at $30,248,434, compared with $31,243,310 in August.

Foreign dealers and factory branches stocked up with cars in August in order to prepare for the automobile shows in September and October. The opening of an assembling plant in Australia tended to increase export of parts for assembly. Light car exports showed the greatest decline, perhaps because of increased competition from the European light cars, but probably to a greater extent by curtailment of Ford car exports, incident to preparation for the improved models. This feature of September exports is also emphasized by the increase of $134 in the average value of all passenger car and truck exports. Normal flow of automobile exports was also hindered by depressed economic and unfavorable climatic conditions in some markets. Foreign purchasers, especially in Thorpe spoke.

Motor Truck Industries Discuss Parts' Standards

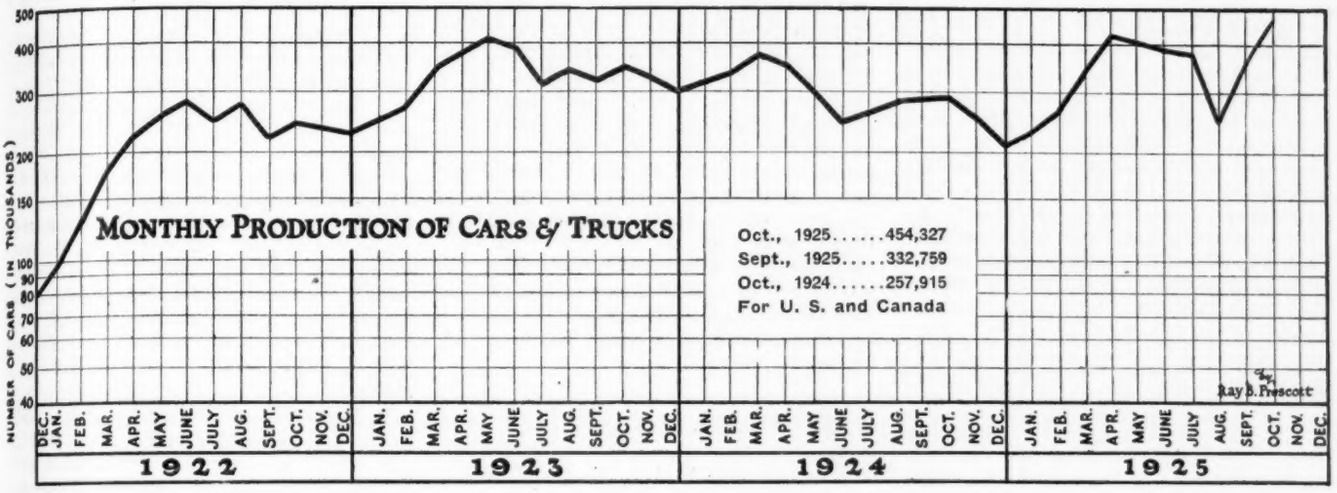
WASHINGTON, Nov. 12 — Motor Truck Industries, Inc., meeting here yesterday and today, had as the subject under discussion the standardization of parts. Various speakers addressed the gathering, and at the banquet, held last night at the New Willard Hotel, Merle Thorpe, editor of The Nation's Business, was among those who spoke.

The group observed Armistice Day by visiting the tomb of the Unknown Soldier and are to be received at the White House today by President Coolidge, prior to a tour of investigation of the Bureau of Standards.

M.A.M.A. Publishes Fall Meeting Report

NEW YORK, Nov. 12—The Motor and Accessory Manufacturers Association announces in its current General Service Bulletin that a printed report of the Fall meeting of the M. & A. M. A. is ready for distribution. It contains, among other features, abstracts of the addresses of F. H. Sisson, M. W. Thorpe, W. T. Morris and others.

October Sets New Production Record



Seek Trade Interest in National Shows

New York Meeting Considers Question—"Solicitation" to be Allowed

NEW YORK, Nov. 10—The necessity of increasing trade interest in the New York and Chicago National automobile shows was emphasized at a luncheon given by Sam A. Miles, manager of the show department of the N. A. C. C., at the Engineers Club last week and attended by representatives of the Motor and Accessory Manufacturers Association and various automotive trade papers.

Discussion developed that, with 1925 promising to be perhaps the largest production year in the industry's history, with motor stocks acting as the bellwether of the bull market on the New York Stock Exchange, and with many recently added models to be displayed at lower prices, interest of the public in these shows was expected to be larger than ever, but it was realized that there must be greater interest in the National shows on the part of the trade itself, if the exhibitions are to attain and retain maximum value to the industry.

Trade Days Advanced

Various means of attaining this end were considered, with special emphasis upon the value of the two trade days at the New York show, Monday and Tuesday. This year, these days have been advanced to accommodate factory officials and others who find it difficult to leave their home offices for New York before Saturday or Sunday. But the conviction was expressed that the value of these trade days would be somewhat discounted if what is called the "hotel headquarters" practice were continued.

It has become the custom among factory representatives and others to make their headquarters at hotels during the show, and for this reason it has often been difficult for dealers to find just the men they wished to talk with. It is probable that the N.A.C.C. will take some steps to impress upon exhibitors the necessity of attendance at the show itself upon the part of their representatives. The opinion was expressed that, at each booth, at least one representative qualified to discuss the product technically, as well as salesmen, should be present at all times.

It was regarded as especially necessary that car engineers be present at the booths. In this regard, the Society of Automotive Engineers will cooperate. It is probable that at least one special meeting of the Metropolitan Section of the S. A. E. will be held in New York during show week.

45 Manufacturer Exhibitors

Although the number of manufacturer exhibitors has decreased this year from 51 to 45, the number of models on display will be about the same as last year.

The importance of focusing the attention of the entire trade on the two National shows is illustrated by the recent action of the N.A.C.C. in declining to participate as an organization in the Philadelphia Sesqui-Centennial celebration.

The suggestion that exhibitors should refrain from soliciting orders during the show has been abandoned. The questionnaire sent to exhibitors by the N.A.C.C. show department evoked an almost unanimous disapproval of this suggestion as impracticable and impossible of enforcement.

Indiana Piston Ring Co. Buys Plant

HAGERSTOWN, IND., Nov. 12—The Indiana Piston Ring Co. has purchased the plant of the Teetor-Hartley Motor Corp. of this city, and is remodeling it to form an addition to its own factory. The new factory is expected to be in full operation by Dec. 1, when, it is hoped, the daily capacity of the company will be 100,000 Perfect Circle piston rings.

Chevrolet Output Exceeds Schedule

55,504 Cars and Trucks in October is 1,000 More Than Planned

DETROIT, Nov. 12—With 55,504 passenger cars and trucks, 1,000 more than its original schedule, as the output for October, the Chevrolet Motor Co. has announced that the production for the last month was the third highest in the history of the company.

In September, 55,865 units were built, which exceeded the production schedule by 2,700, making it the second highest output month in Chevrolet history. September, 1923, is the record month.

According to W. S. Barth, vice president and manager of manufacturing, the average output for the company in the last seven months has been 52,457 monthly. July was the only month when production fell below the 50,000 mark, 45,670 passenger cars and trucks being the figure for that month.

Victor Rubber Products Co. to be Incorporated

COLUMBUS, O., Nov. 10—Following the passing of deeds, the new owners of the plant of the Victor Rubber Co. filed application with the Secretary of State here for the incorporation of the The Victor Rubber Products Co. with a capital stock of $150,000. The incorporators are: J. B. Cartmell, president of the First National Bank; George Cugley and Arthur R. Hill, of the Buckeye Incubator Co.; R. F. White, of The Victor Rubber Co.; and T. W. Anthony.

Mr. Cartmell says that the manufacture of rubber mats for the Ford Motor Co. and others will be continued, and that mechanical rubber products of various kinds are to be added soon.

U. S. Court Grants Palmetto Petition

NEW YORK, Nov. 11—Petition of the Palmetto Fire Insurance Co. for an injunction to restrain James A. Beha, State superintendent of insurance from revoking the company's license in New York was granted in a decision by Judge Rogers in the U. S. District Court yesterday. The petition had been filed after Beha had indicated that he would revoke the license on the ground that the Chrysler-Palmetto automobile insurance plan constituted a violation of the laws and public policy of the State of New York.

The court overruled the Beha contention that this was a suit against the State and could not be maintained in Federal Court without the State's consent. The court held that, while the State had power to exclude a foreign insurance company from doing business within its limits, or to impose on it conditions deemed proper, as precedent to its right to do such business, the State could not forbid contracts of insurance relating to risks within its limits from being made between citizens and a corporation in another State, since such an attempt would violate the citizen's liberty to contract under the Fourteenth Amendment to the Federal Constitution.

Whether or not Chrysler-Palmetto insurance contracts made under Michigan laws were valid in New York was not regarded by the court as within its purview, but merely whether the license of Palmetto in its business does not violate New York laws and could be revoked because of the manner in which it does business in a third State, where that business is valid.

The court held that the recent Ohio decision refusing to enjoin the State insurance commissioner there from revoking the Palmetto license hinged upon the Ohio resident agent law, and New York has no such law. The court held also that, in making its contract with the Chrysler Sales Corp. in Michigan and in acting under that contract, Palmetto was not doing business in New York and that "where applications for insurance are obtained in a State by the agent of a foreign company and forwarded by him for acceptance or rejection to a company outside of the State, the company is not doing business in the State wherein the applicants reside."

8,088 Oaklands Set New Monthly Figure

PONTIAC, MICH., Nov. 10—Oakland continued its good pace in October, shipping 8,003 passenger cars to its dealers. According to Alfred R. Glancy, president and general manager, these figures are practically synonymous with sales.

The monthly output was 8,088, a single car more than the production quota set for the period. The factory sales beat the previous high monthly sales record established in February, 1924, by 14½ per cent. October, 1924, was exceeded by 146 per cent, and September of this year by 63 per cent.

Present plans call for the daily production to be increased during the present month, December and January.

A. L. A. Discusses Lighting Standards

CHICAGO, Nov. 10—The subject of uniform automobile lighting legislation was considered at the second meeting of the Automotive Lighting Association at the Drake Hotel recently. It is said that about one-third of the cars in use are not run at night because of the hazards due to poor lighting, much of it due to conditions which are capable of being corrected. These conditions, however, have led legislatures to pass laws which, in many cases, are unwise, and cause unjust restrictions, yet, due to lack of cooperation from well informed bodies, the legislatures were left without guidance.

A legislative committee and a standardization committee were appointed at the first meeting of the Automotive Lighting Association last April, and the work of these committees was presented at the meeting in the form of a pamphlet.

The meeting also adopted by-laws and elected the following officers: president H. W. T. Collins of the Cincinnati Victor Co., Cincinnati, Ohio; vice president, T. K. Quinn, General Electric Co., Cleveland; secretary and treasurer, W. S. Murtfeldt, National Lamp Works, Cleveland. The following directors were also elected: J. F. Brown, S. M. Lamp Co., Los Angeles; C. H. Blumenauer, Jefferson Glass Co., Follansbee, W. Va.; J. H. Cattell, Warner Patterson Co., Chicago; W. F. Anklam, C. M. Hall Lamp Co., Detroit; C. C. Mortenson, Stover Signal Engineering Co., Racine, Wis.

Developments of the Week in Leading Motor Stocks

NEW YORK, Nov. 10—It were idle to base the drastic decline in the prices of motor stocks in the early days of this week upon a serious change in the fundamentals of finance, commerce or industry. It is true that the Boston Federal Reserve Bank increased the rediscount rate from 3½ to 4 per cent and this action was taken to foreshadow similar action by the local Federal Reserve institution. This does not of necessity follow. The wholly unjustified and unwarranted levels to which speculation had driven the prices of many motor stocks; the widespread public speculation in these stocks and the apparent belief that consolidations and mergers, extra dividends and melons all would result in benefits to the holders of these stocks, regardless of the price paid, had resulted in a weakened speculative position which had to fall sooner or later of its own weight.

That banks had discriminated sharply against many of these stocks in their loans was a matter of common knowledge. It took only a minor negative development to start an avalanche of selling. The decline is in no wise indicative of any unfavorable development in the industry, immediate or prospective. He who draws such an inference from the stock market action is quite as likely to err in his reasoning as did those optimistic souls who believed only recently that there was no top to the market for automobile shares.

The intensity of the decline is recorded in such losses on Tuesday as 27 points in Chrysler Motors, 18 in Hudson Motors, 13 in General Motors, 11 in Fisher Body and proportionate declines in other issues.

That production and consumption of goods are in large volume is attested by the many forms of statistical data available to the public. Thus, the week's volume of business, as indicated by debits to individual accounts by the reporting banks of the Federal Reserve cities, shows an increase of 3 per cent over the corresponding period of a year ago.

This activity is general, not alone in the primary markets of production, but among retailers and through all the intermediate distributive channels. Striking evidence of the improvement in the steel industry was afforded by the unfilled tonnage figures of the United States Steel Corp., which showed an increase of some 391,000 tons as of October 31. The gain was steady throughout the month and notable was the volume of business placed for delivery, not only in the first quarter of next year, but well into the second quarter. While the decline in cotton prices has made a somewhat uncertain market for cotton textiles, the woolen branch of the textile industry is apparently on a firm foundation of stabilized prices and strong demand.

Political developments in France have retarded the working out of the credit problem for European consumers of copper and this was reflected in a dull, but otherwise featureless, market for the metal. Railroad freight loadings attest the large volume of goods passing from production into consumption, and a record volume of sales reported by retail stores throughout the country is equally strong evidence of the great individual purchasing power.

With these, the manufacturer and merchant are concerned. With the vagaries of stock market speculation, they are not. It would be unfortunate if they were to deduce from the stock market action any unfavorable development in industry. Such conclusions are not warranted at this time.—H. H. S.

Nineteen Chassis of Six Lands at Salon

New York Exhibit to Include Colorful Combinations in Bodies

NEW YORK, Nov. 10—Birds will occupy an important place in the Twenty-first Annual Automobile Salon which will be at Hotel Commodore Nov. 15. Colors which Nature lavishes upon the feathered songsters have been adapted to motor car bodies, and a stuffed bird from whose plumage the new shades have been designed will be exhibited with each Lincoln car thus adorned.

Last spring, the Lincoln people obtained from museums sixty stuffed birds distinguished for their beautiful color effects. Heretofore, it has been unwritten law that two or multi-colors in cars must harmonize. The stuffed birds were studied by experts in an attempt to adapt to car bodies those strongly contrasting colors. Special paints were devised to approximate these clashing effects of colors new to automobiles, and the Lincoln at the Salon will show a dozen such bodies, the color design of each being after the bird shown with it.

New Color Designs Prominent

Several other makes of cars will be featured by new color designs. They are offered to the people who like to have their cars talked about and the Lincoln people anticipate little difficulty in selling such cars even to people already owning the more conventional Lincolns.

This Salon will be the largest ever held. The 111 cars, each an individual job, will occupy all the space on the ballroom floor except the kitchen. The exhibits will fill three ballrooms, three private dining rooms, three foyers, the main lobby and two end rooms. This will be a "million dollar salon," since the average price of each car will amount above $8,000.

Some Outstanding Foreign Cars

One feature will be a gold-plated Isotta Fraschini eight chassis. To finish this job Capt. Hugo V. D'Annunzio, son of the Italian poet and president of the Isotta Motors Co., importers here, spent 65,000 lire.

The Rolls-Royce exhibit will be distinguished by four cars whose coach work was done by New England concerns and modelled after the lines originated by Barker of London. Four leading coach builders will also exhibit special Rolls bodies. This is said to be the first time that coach designers have been able to equip the Rolls chassis with bodies of their own design. Also there will be one Rolls with needle-work upholstery, upon which two and a half million hand stitches were lavished.

The exhibiting carrossiers will include Blue Ribbon, Brewster, Brunn, Derham, deCausse, Dietrich, Fisher, Fleetwood, Holbrook, Judkins, Le Baron, Locke, Merrimac, Rollston and Willoughby. The custom bodies of the designers will be mounted on nineteen chassis representing six nations—Amilcar, Brewster, Cadillac, Cunningham, Duesenberg, Franklin, Isotta-Fraschini, Lancia, Lincoln, Locomobile, Marmon, Maybach, Mercedes, Minerva, Packard, Pierce-Arrow, Renault, Rolls-Royce and Wills Sainte Claire.

Nash Production Now 8,000 Monthly

MILWAUKEE, Nov. 12—With the approach of winter, the Nash Motors Co. and the Seaman Body Corp. which supplies bodies for Nash cars, are slackening production slightly at both Milwaukee and Kenosha, Wis., plants. Operations, however, are far more active for this time of year than at any time in their history, and although Nash production is tapering off, output at the Ajax plant at Racine is being pushed to catch up with the heavy demand for cars.

Output of the Nash factories, exclusive of the Ajax subsidiary has been running about 500 cars a day against 595 during the peak in August. Slowing down of the turnout of Nash cars has enabled the Seaman Body Corp. to get back on a normal basis and night shifts have been discontinued. The force has thus been reduced from 3,900 to 3,500 men. Current output is about 8,000 bodies a month, against 11,000 in September and 6,400 in August, the biggest production before erecton of the new plant addition.

Chicago Tool Gets Benz-Diesel Rights

CHICAGO, Nov. 11—The Chicago Pneumatic Tool Co. has acquired manufacturing and sales rights for the United States and Canada to the Benz solid injection Diesel engine. At present, the company says it does not plan to produce these engines for use in automobiles, but rather for power plant and stationary engineering uses. All literature thus far received from Germany is printed in German, and no translation has been made. For this reason, exact details of possible uses have not been announced. Production at the local plant is expected to start within two or three months, possibly sooner, and, although distribution plans have not been completed, it is presumed distribution will be through the present channels of the company.

Lord Urges Periodic Maintenance Service

(Continued from page 836)

At the closing session, T. A. Boyd, General Motors Corp., talked on "Fuel from the Standpoint of the Service Man," and Donald Blanchard, *Motor World Wholesale*, presented a paper on "New Devices for Improving Motor Car Operation."

G. M. Declares $5 Extra Dividend

Total Dividends for 1925 Thus Amount to $10 on the Common Stock

NEW YORK, Nov. 12—The Board of Directors of General Motors Corp., meeting today, declared the regular dividend of $1.50, payable December 12, and a special dividend of $5, payable January 7, both to common stock of record November 23. In addition, the usual preferred and debenture stock dividends were declared, payable February 1, to stock of record January 4.

President Sloan says that the $5 extra dividend, together with the $1 extra dividend for 1925, in addition to the regular dividend of $6, or a total of $12, which the directors feel represents a distribution to which the stockholders are entitled by reason of the splendid earnings and strong financial position of the corporation.

Company's Financial Position

The corporation has cash and marketable securities, aggregating upward of $155,000,000, which represents more than 30 per cent of its net capital employed. It has no debts of any kind, other than current accounts. The only securities ranking ahead of its common stock are its preferred issues, aggregating less than $110,000,000, or about $45,000,000 less than its cash and securities. The dividend charge on its senior securities for the nine months to September 30 is $5,729,794, or about 7 per cent of the earnings of the corporation and its subsidiaries, aggregating $80,021,018 in the same period.

The cash requirements for plant additions and replacements in 1925 will aggregate less than the cash accumulated through the depreciation reserve account. This is due largely to the fact that the corporation, through relatively small expenditures, has been able to care for its large and expanding business.

Estimated sales to dealers by General Motors divisions in October were close to 96,000 cars and trucks, compared with 45,552 in October last year and about 6,000 higher than the management's earlier estimates. Sales in September, the best previous month, were 89,000, and in April, the peak month of the Spring season, sales were 85,583. October retail sales were within 10,000 units of the number purchased by dealers, indicating only a nominal accumulation of unsold cars, notwithstanding the high production. On an average profit of $130 per unit General Motors' October net earnings might be estimated around $12,500,000 against average monthly earnings of $9,500,000 in the record-breaking second and third quarters this year. With prospects of 150,000 units produced in the last two months of this year, total sales for 1925 would approximate 850,000 against 798,555 in the record-breaking year, 1923.

Eaton Axle Acquires American Parts Co.

Preferred of New Eaton Spring Corp. to Pay American Foundries for Sale

DETROIT, Nov. 10—It is announced that the Eaton Axle & Spring Co. last week acquired the plant and business of the American Auto Parts Co. The deal was put through without any new financing on the part of Eaton Axle and Spring. The property here consists of fifteen acres of land, centrally located, with more than 200,000 sq. ft. of manufacturing space in modern fire-proof buildings, having excellent switching facilities. The plant was completed about four years ago. The addition of this plant, it is said by company officials, will enable Eaton Axle & Spring Co. to devote all of the capacity of the Perfection plant in Cleveland to its bumper business.

Now Has Three Principal Units

A dispatch from Cleveland states that the Eaton Spring Corp. is being organized under Ohio laws, the preferred of which will be accepted by the American Steel Foundries in payment for the purchase of the American Auto Parts Co. by Eaton Axle & Spring Co. All of the common of the Eaton Spring Corp. is to be owned by the Eaton Axle & Spring Co. The latter company will have three principal complete units, the axle plant in Cleveland, the spring plant here, and the bumper plant in Cleveland. This company and American Auto Parts Co. have been supplying springs for some of the largest automobile companies, and both have been doing a large spring replacement business in addition.

Pamphlet Stirs Tire Size Discussion

WASHINGTON, Nov. 12—Decrying the present tire situation as one of the most striking examples of economic waste prevailing in industry today, R. M. Hudson, chief, division of simplified practice, Department of Commerce, is distributing to the automotive industry a 30-page memorandum entitled "Fewer Tire Sizes." The memorandum consists of a summary of views of motor car and motor truck manufacturers, tire and accessories manufacturers, dealers' organizations, car owners and others interested, practically all of whom agree that something should be done to bring about tire standardization.

Mr. Hudson declares that some who are acquainted with the efforts being made to simplify tire sizes by the committees from the Rubber Association of America, the National Automobile Chamber of Commerce, the Society of Automotive Engineers, etc., feel that progress is being made. Others do not. A large number express the belief that action will be expedited, if the Department renders the same service it is rendering to so many other industries having simplification problems.

Practically all motor car manufacturers who replied, the summary states, are agreed that standard tire sizes can be established only as the several interests co-ordinate their views, and co-operate in the application and support of whatever standards are ultimately set up.

Wheel and rim manufacturers also agree, continues the summary, that one obstacle to economy in production of wheels and rims is the present multiplicity of tire sizes. They recognize the necessity of keeping pace with new developments in automotive design, and, during a transition period from one design to another, there is bound to be some overlap, with consequent increase in varieties offered. However, if the new design is admittedly superior to the one it supersedes, it soon becomes the "standard of the day." Practically all favor a greater degree of simplification than now prevails and are willing to co-operate to bring it about.

DENIES SALE RUMOR OF PAIGE-DETROIT

DETROIT, Nov. 10—Flat denial that there is a deal pending toward a change of ownership or of management of the Paige-Detroit Motor Car Co. making Paige and Jewett six-cylinder cars, is made by H. M. Jewett, president.

Mr. Jewett issued a brief statement in reply to a widely published rumor that control of the company had passed to a large local manufacturer of four-cylinder cars. Mr. Jewett said:

"The Paige-Detroit Co. not only has not changed hands, but there has been and will be no negotiation. The company has been operating most successfully under the present management for many years and is planning to push its present advantage in the six-cylinder field by aggressive policies of manufacturing and merchandising."

Balloon Tires for Commercial Cars

AKRON, Nov. 10—Widespread adoption of balloon tires for commercial car use is forecast by tire engineers, who have been giving close attention in the last half dozen years to the growing truck and bus field.

High speed buses and trucks generally will adopt the balloon tire as the ideal for that service, in the opinion of Miller engineers, who already have produced balloons suitable for this class of service. Commercial car tires are being made more flexible and with greater air space. Many trucks and buses are now being equipped with balloon tires. They are proving sucessful to a remarkable extent, it has been found. And, tire men say, their popularity every day is becoming more pronounced.

Dodge Assets Far Exceed Liabilities

Former Placed at $62,002,988; Latter at $16,985,726—Good Will, $1

DETROIT, Nov. 9—The general balance sheet of Dodge Bros., Inc., copies of which are now being sent by the company to stockholders, discloses, as of September 30 last, total assets of $116,061,044. Of this, total current assets amount to $62,002,988, or nearly four times total current liabilities. Good will is carried at $1.

Cash on hand is carried at $23,937,541. Surplus, including earned surplus, surplus arising upon acquisition of assets and from conversion of debentures, amounts to $30,934,875. In addition, the company has contingency and other reserves of $7,046,991.

A summary of the balance sheet follows: Current assets, $62,002,988; property, less depreciation, $48,728,961; other assets and investments, $5,230,355; prepaid insurance premiums, $98,738; good will, $1.

Liabilities: Current liabilities, $16,985,726; reserves, $7,046,991; funded debt, $60,000,000; preference stock at nominal amount of $193,452; common stock, Class B, at nominal amount of $50,000; surplus, $30,934,875.

The capital stock of the company (no par value) has been issued almost entirely against the company's established earning power, which is not assigned a value in the balance sheet.

Reading Co. Applies for Bus Certificate

PHILADELPHIA, Nov. 10—A $1,000,000 corporation has been formed to operate motor coaches over the entire Reading Co. system. Application for a certificate of public convenience for the Reading Transportation Co., a subsidiary of the Reading, has been made to the Public Service Commission at Harrisburg.

While the application requests the privilege of operation in Schuylkill Co. only, the company announced that other routes would be established over the areas served by its 1,582 miles of tracks.

Incorporators of the Reading Transportation Co. are officials of the Reading Co., as follows: A. T. Dice, president; C. H. Ewing, vice-president; E. D. Hilleary, vice-president; J. V. Hare, secretary; H. E. Paisley, treasurer; W. L. Kinter, general solicitor, and E. D. Osterhout, passenger traffic manager.

MOTORIZATION OF R. F. D. ROUTES

WASHINGTON, Nov. 10—Motorization of 498 new rural free delivery routes has been announced by the Post Office Department.

Rubber Tonnage in Third Quarter Less

78,552 is Figure Used for Tires, Comparing With 82,007 Last Year

NEW YORK, Nov. 10—In the third quarter of 1925, the Rubber Association of America, Inc., reports that 78,552 tons of crude rubber, with total shipment sales value of $223,615,000, were used by manufacturers of tires and tire sundries, as compared with 82,007 tons of $225,692,000 shipment sales value in the previous quarter.

Inventory of crude rubber at the close of the third quarter shows 33,131 long tons on hand, compared with 47,770 at the end of the second quarter, and 50,480 afloat for United States ports against 48,708 at the close of the preceding quarter.

Rubber Afloat Increases

It is interesting to note that crude rubber afloat for American ports has been increasing since the fourth quarter of 1924 and that on Sept. 30 this year they approximated the total reported afloat at the end of the third quarter last year.

Production of reclaimed rubber and the consumption of scrap rubber in manufacture reclaimed have been increasing for a year. Third quarter reclaimed rubber production this year was 31,909 long tons against 27,523 in the second quarter and shipments rose from 23,651 in the second to 29,910 in the third quarter. Consumption of scrap rubber in manufacture reclaimed increased from 15,721 to 17,546 long tons.

The association estimates the crude rubber consumption figures to be 92 per cent of the total and the crude rubber inventory figures to be 95 per cent of the total for the entire industry.

$5,065,262 is Value of Rubber Exports

WASHINGTON, Nov. 12—Increasing tire prices are chiefly responsible for the establishment of a new high record value for monthly exports of rubber goods, $5,065,262 in September, 1925, breaking the previous record made in August of this year by about $22,000, it is announced here by the rubber division, Department of Commerce. At the average rate of monthly exports for the first three quarters of 1925, the total value of shipments this year will exceed $50,000,000.

"The tire export trade of the United States this year," says the division, "has been very heavy as compared to the last three years. In fact, the total exports of automobile casings from the United States to non-contiguous territories and foreign countries in 1924 numbered but 1,389,000 as compared to 1,360,000 in only nine months of 1925. It is apparent that, if the average rate of shipments is maintained, the United States' exports this year will approximate 1,800,000 automobile casings."

Avery Co. Sale at $650,000 Planned

CHICAGO, Nov. 10—A court hearing has been set at Peoria, Ill., for Nov. 14, at which creditors of the Avery Co. are requested to show cause why an offer of $650,000 cash for the properties, approved by 90 per cent of the creditors, should not be accepted as recommended by J. W. McDowell, trustee in bankruptcy.

The involved property includes all the Averyville site, buildings and contents, with the exception of the main office, which was sold some time ago, and the two threshing machine buildings, which were recently sold to the W. B. Wilde Co. The offer follows the appointment of a committee of the Peoria Association of Commerce to co-operate with the business men of the city. When the proposition to buy the Avery plant and keep the business in the city was made, the money was raised rapidly and without a selling campaign of any sort.

The Avery Co. closed in March, 1924, as a result of the agricultural slump at the end of the war. Trustee McDowell has kept a part of the plant running making repairs and replacements. The names of the proposed new owners have not been disclosed.

Olds Closed Cars 85% of Production

LANSING, MICH., Nov. 12—Oldsmobile manufacture of closed cars has increased approximately 35 per cent over that of a year ago, it was said by officials today. A year ago, 50 per cent of all passenger cars shipped from the Olds plant here were closed jobs. Today, officials said the average was 85 per cent.

Of the entire production this year up to the present, 75 per cent were closed models, the remaining 25 per cent being open models and chassis. The domestic sales, however, were 85 per cent closed and 15 open. The export sales show that only 21 per cent were closed jobs.

To Sell and Reorganize Motor Truck Company

SPRINGFIELD, O., Nov. 10—Interest here centers in the sale and reorganization of the Kelly-Springfield Motor Truck Co. on Nov. 23 at the plant by Receiver Lewis. It is expected that three bids will be submitted, and it is the understanding that an Eastern syndicate will probably make the high bid. It is assured that the company will be placed on a sound financial basis and that the plant will be operated with a large force.

FINANCIAL NOTES

Lee Rubber & Tire Co.—The income account of this company shows net sales for the quarter ended Sept. 30, 1925, of $3,264,760, as compared with $3,499,297 in the corresponding period of 1924. Net sales for the nine months ended Sept. 30, 1925, were $9,324,164, as compared with $10,161,831 for the corresponding period in 1924. Net income for the third quarter this year was $79,279, as compared with a deficit for the same period last year of $22,022. Net income for the first nine months this year was $237,339, as compared with a deficit for the corresponding period last year of $186,588. Earnings for the first nine months this year were $1.11 per share on the 214,837 no par shares, against no earnings last year.

Firestone Tire & Rubber Co.—It is announced that plans have been approved for a $500,000 extension program to the Hudson, Mass., plant of the Firestone-Apsley Co., an affiliated company, to include the erection of a five-story steel and concrete addition to the factory on land which the company recently acquired from the Boston & Maine R. R. A 20 per cent expansion is to be made at the Firestone cotton mills, a subsidiary, at Fall River, Mass. About $250,000 is to be invested in new equipment, which is expected to be ready Jan. 1, 1926. Employment for approximately 300 persons will thus be provided.

Federal Motor Truck Co.—On Nov. 7, an issue of $1,500,000 of this company's serial 5 per cent gold debenture notes, due Nov. 1, 1926 to 1931, was offered at 98¾ to 100 and interest by Harris, Small & Co., Detroit. The proceeds are to be used for extending marketing facilities and other corporate purposes. The debentures are the direct obligation of the company, which may not place a mortgage on its property while these notes are outstanding. Net earnings of the company for the nine months ended Sept. 30 1925, were $1,113,946.

Stewart-Warner Speedometer Corp.—Directors have declared $1 extra dividend and regular quarterly dividend of $1.25 on common, payable Nov. 15 to holders recorded Oct. 31.

October sales have run 125 per cent ahead of the same period last year and 80 per cent higher than July, the leading month in the preceding quarter.

Borg & Beck Co.—Net income, before taxes, for the quarter ended Sept. 30 was $142,779, or $1.14 per common share and, for the nine months ended on that date, net income was $419,479, or $3.36 per share, compared with $202,327, or $2.02 per share, in the same period in 1924.

Martin-Parry Corp.—This corporation has declared dividend of 50 cents per share on capital stock payable Dec. 1 to holders recorded Nov. 16.

Yellow Truck & Coach Manufacturing Co.—The New York Stock Exchange has admitted to its list temporary certificates for this company's 7 per cent cumulative preferred stock.

Mack Trucks, Inc.—The New York Stock Exchange has admitted to its list 67,946 additional shares of this company's no par common.

Men of the Industry and What They Are Doing

Swigert Production Manager

The appointment of W. K. Swigert as production manager of the Stutz Motor Car Co. of America, Inc., has been announced by Fredrick E. Moskovics, president of the company, at a dinner at which both Mr. Swigert and Frederick P. Nehrbas, who has resigned as production head of the company, were guests. Mr. Nehrbas, who has been production manager of Stutz since Spring has been appointed an executive of the Hercules Corp. plant of Graham Bros. in Evansville, Ind. Graham Bros. is a subsidiary of Dodge Bros., Inc. The Hercules plant was recently taken over by Graham and it will produce mechanical refrigerators, commercial motor vehicle bodies and gas engines.

Mr. Swigert is a veteran of the industry. His first association with automobile building was with the Crawford Automobile Co. in 1905, followed by several years with Matheson. After serving as plant manager of Chalmers, he came to Indianapolis during the war and was in charge of the Liberty Motor division of Nordyke & Marmon Co. Later he was manager of the Rochester Motors Co., Rochester, N. Y.

Mr. Moskovics, who presided at the dinner, expressed the regret of the organization at Mr. Nehrbas leaving and introduced Mr. Swigert. Vice-President E. S. Gorrell and Charles E. Crawford, chief engineer, joined in welcoming talks and Mr. Swigert and Mr. Nehrbas also spoke briefly.

Chandler Asst. to President

Henry T. Chandler, who has been associated with the Vanadium Corp. of America since Jan. 1, 1923, as metallurgical engineer at the Detroit headquarters, has been appointed assistant to the president. Prior to his association with this concern he was engaged in research and development work in the automotive field. From 1914 to 1920 he was in charge of the research laboratory of the Ford Motor Co. and for the next three years he was with the C. H. Wills organization as metallurgical engineer. His headquarters continue at Detroit.

Brown Buys Company

Wm. H. Brown, who has been in charge of the Hanson Brown Motor Co., Denver, Colo., has purchased the interest of his partner in the business and the company will hereafter be known as the Wm. H. Brown Motor Co.

Morris Asst. Sales Mgr.

W. O. Crabtree, sales manager, Flint Motor Co., announces the appointment of George R. Morris as assistant sales manager. Mr. Morris has had considerable experience in merchandising automobiles.

DODGE SECURES U. S. OFFICIAL

Homer E. Elder, statistical expert of the automotive division, U. S. Department of Commerce, has resigned that position to head the research department of foreign sales of Dodge Bros., Inc., with headquarters in Detroit. Mr. Elder's successor in the Department has not yet been appointed.

With the acquisition of Mr. Elder's services, it marks the second official the Dodge company has secured from the Department in the last six weeks, the first being Percy Owen, formerly chief of the automotive division who has been made director of foreign sales of the Dodge company.

Firestone Men Sail

The Firestone pioneers, who are going to Liberia to develop rubber plantations there, have been making ready to get on their new jobs. Two groups are now on the way. In the first party are Donald Ross, plantation manager; P. F. Taylor, chief assistant to Ross; W. H. Johnson, planting assistant and E. H. Farquharson, senior planter. Those in the second group are A. W. Holcomb, mechanical engineer; Warren Brockett, his assistant; L. L. Putnam, junior planting assistant; W. T. Krumm, accountant; C. B. Mansfield, soil expert and W. F. Peel, pathologist, the last two of the U. S. Department of Agriculture. On November 28, Ross Wilson will sail to act as assistant in surveying.

Thorne Sales Manager

C. J. Thorne has been appointed general sales manager of the Turner Mfg. Co., Kokomo, Ind., according to an announcement by E. W. Turner, president. Mr. Thorne became connected with the Turner Co. four years ago, when he took a position as traveling sales representative. It is said that special attention will be given to broadening the outlets for Turner products.

Rippingille Made Measurer

E. V. Rippingille, sales manager of the Dayton Engineering Laboratories Co., Dayton, O., has been made measurer of the American Power Boat Association, the National power boat organization. The office of measurer is equivalent to chairman of the technical committee of the contest board of the A. A. A. in automobile racing.

Flogaus Sales Engineer

Howard A. Flogaus announces his connection with the Skinner Automotive Device Co., Detroit, in the capacity of sales engineer.

Goudard to Build Branch

Maurice Goudard, one of the three owners of the Solex Carbureter Co., will sail shortly for the United States to organize a manufacturing branch of the company at Detroit. Mr. Goudard spent several weeks in America early this year, and returned with the conviction that the Solex carbureter could be manufactured and marketed successfully in the United States. While admitting that carbureter problems in America and Europe are not at all the same, Mr. Goudard states that, for economy and efficiency, he can equal others, and that he has the advantage of simplified design and lower production costs. Buildings will be erected and plant installed without delay, so as to enable the American Solex to be in production next year.

Waddle and Caswell Named

The appointment of George A. Waddle, manager of dealers relations, of the Goodyear Tire & Rubber Co., of Akron, and F. B. Caswell, vice-president of the Champion Spark Plug Co., of Toledo, to represent their respective industries at the forthcoming National Distribution Conference, to be held in Washington on December 15 and 16, was announced this week by the Chamber of Commerce of the United States.

Representatives of the automotive industry, body builders and allied industries will also be appointed to participate in the conference, which is directed against unsound practices in distribution.

Coleman Makes Address

Thomas Coleman, vice-president of the Madison-Kipp Corp., was the principal speaker at the first Fall meeting of the Milwaukee section of the Society of Automotive Engineers, held at the Blatz Hotel last week.

Mr. Coleman had as his topic "Engine Lubrication," and, since he has given years of study to this problem, he presented facts of great interest to club members.

Mann Travels Far

F. S. Mann, of Adelaide, Australia, is traveling 11,500 miles to participate in the Second Motor Transport Congress, to be held here Jan. 11-13, at the time of the automobile show. Mr. Mann represents the Motor Traders of South Australia. At the beginning of 1925 it was estimated that there were 28,300 motor cars and 3,000 commercial vehicles in South Australia.

Palmer Back From Europe

John J. Palmer, export executive of Dodge Bros., Inc., has returned to Detroit after a survey trip through the different European countries. He concluded his journey by attending the Olympia Motor Show held recently in London.

New Locomobile "90" Has Smaller Engine

First Public Showing to be at N. Y. Automobile Salon—Special Features

BRIDGEPORT, CONN., Nov. 12—A new "Ninety" model is being announced by the Locomobile Co. of America, which, with standard bodies, will sell at prices ranging between $5500 and $7500. In addition to the standard bodies, the chassis will be fitted with a variety of custom bodies.

Seven body types are being offered on this new chassis, namely, a roadster, touring, victoria coupe, victoria sedan, cabriolet, brougham and enclosed drive limousine. The first public showing of the new "Ninety" will be at the Automobile Salon, Commodore Hotel, New York, November 15. The object of the Locomobile Co. in bringing out this new model was to complete its line.

The engine has six L-head cylinders with a bore of 3⅞ in. and a stroke of 5¼ in., giving it a total displacement of 371 cu. in. It is said to develop 86 hp. at 2800 r.p.m. The cylinders are cast in a block, while the head is detachable. There are seven main bearings on the crank shaft, which is fitted with a Lanchester vibration damper at the forward end. The camshaft is supported in four bearings and is driven by a Link Belt chain with automatic take-up.

Full Pressure Oil System

A full pressure oiling system is used, the oil being drawn from the pump through strainers by means of a gear pump and forced to the camshaft bearings, main bearings, crank pin bearings and timing chain idler bearing.

A full automatic, plain tube type of carbureter is fitted, in conjunction with a special design of manifold of the hot spot type. Fuel is obtained from the 21-gallon tank by means of a pressure pump driven off the camshaft. The electrical system, including the starting, lighting and ignition equipment, is of DeJon make, and is used together with a 166 ampere-hour battery. Spark advance is by hand and automatic control combined.

A single plate type of clutch is used, together with a three-speed transmission, the latter being mounted separately on the frame, with a flexible coupling between it and the engine. A special steering gear with the Ross cam and trunnion mechanism is fitted. The front axle is of Locomobile design but built by the Eaton Spring & Axle Co. It is of the reverse Elliott type and is fitted with taper roller bearings. The rear axle also is a Locomobile design and manufactured by Eaton. It is the semi-floating type, with alloy steel bevel pinion and ring gear and fitted with ball and taper roller bearings. Three different axle reductions are used, the standard reductions being 4.15:1 for the roadster and 4.5:1 for all other models, in addition to which customers are given an option on a 4.75:1 ratio.

Four-Wheel Brakes Standard

Four-wheel brakes are standard equipment, the Bendix-Perrot three-shoe type being used on all four wheels. The brake drums are 15 21/32 in. in diameter, on the inside. The hand brakes operate on the rear wheels only. All springs are semi-elliptic, the front ones measuring 40 by 2 in. and the rear ones 60 by 2½ in. Shackles are self-adjusting, all wear in them being taken up automatically.

Balloon tires, 33 by 6.75 in. are standard equipment, and the wheels are of the artillery type. The frame side members are made of 5/32 in. stock, 7½ in. deep and with 1 15/16 in. flanges, and the wheel base is 138 in. and the tread 58¼ in.

Equipment furnished regularly with this model includes an electric motor-driven horn, an automatic windshield wiper, curtains, front bumper, Lovejoy shock absorbers, a tire pump driven from the transmission, air cleaner, and a full set of tools.

Paige-Detroit Shows Increased Earnings

DETROIT, Nov. 11—The Paige-Detroit Motor Car Co. announces that, with the single exception of 1923, the net earnings for the first nine months of the year are greater than the total for an entire year in the history of the company. The figure given is $3,043,174.42, not providing for Federal income and profit taxes, compared with $1,834,552.26 for the entire year 1924. After allowance for dividends, the company's net earnings for the first nine months of 1925 are equivalent to $4.33 a share on the 676,474 shares of common of no par value outstanding on Sept. 30. This compares with $2.37 a share earned in 1924 and $4.50 a share in 1923. The company's balance sheet shows no bank loans.

Fisher Tells of Cadillac Plans

NEW YORK, Nov. 9—Cadillac Motor Car Co. expects to produce about 14,000 cars in the first five months of the fiscal year, which runs from August to August, as against 17,000 for all of last year, according to Lawrence P. Fisher, president, just returned from Europe. He said the company planned production of 3,500 cars monthly soon, but there would not be 1,000 in dealers' hands Jan. 1 because of the difficulty of keeping pace with orders. Mr. Fisher saw no abatement in the demand for all types of cars.

LUXOR BUYS MACHINERY

FRAMINGHAM, MASS., Nov. 10—The Luxor Manufacturing Co. is taking over machinery used by the Bay State Motor Co., in the production of that car and is using it for its own production purposes.

Motor Wheel Corp. Sales Increase 20%

Earnings for First Nine Months of Year $4.14 a Share—Funded Debt Retired

LANSING, MICH., Nov. 10—Earnings per share on common stock of the Motor Wheel Corp. for the three quarters ended Sept. 30, totaled $4.14 per share, according to the statement made public by Harry F. Harper, president and general manager. The surplus for the nine months ended Sept. 30, totaling $5,743,823.60, is greater than the surplus as of December 31, 1924, which totaled $4,099,564.98.

According to the report, in the nine months all of the funded debt represented by the 10-year sinking fund gold bonds, amounting to $1,586,500, was retired and cancelled. In addition, preferred stock has been purchased in the open market in the sum of $565,000 par value. Thus, the preferred has been reduced to almost a third of its original issue. Dividends paid on preferred and common stock amounted to $739,663.40.

The report further states that total assets amount to $13,646,675.31 and current liabilities to $1,185,270.04. The liabilities include accrued Federal taxes for 1925, which are payable in 1926.

According to Mr. Harper, sales for the nine months amounted to approximately $20,000,000, 20 per cent better than for the corresponding period last year. Production for November and December will be near capacity, and contracts are being closed not only for the remainder of the present year but for the first six months of 1926. Production schedules for the first six months of next year will call for a decided increase in output as compared with the first half of 1925.

Plate Glass Output Doubled Since 1918

MILWAUKEE, Nov. 10—Demand for closed cars in the automobile industry has revolutionized the plate glass industry according to H. S. Wherrett, vice-president of the Pittsburgh Plate Glass Co., of Pittsburgh, who spoke at the annual trade sales convention of the paint and varnish division held at the branch plant here.

"Domestic production of plate glass this year," said Mr. Wherrett, "will be about 115,000,000 square feet, while no further back than 1918 it was only about 50,000,000 square feet. Between 40 and 50 per cent of all plate glass consumed in the country is used in automobiles."

Prices of plate glass will continue stable, he believes, and it is the general expectation of the trade that the present price scales are firm and will continue in effect for some time.

About 100 representatives of the company from all parts of the United States were present at the meeting.

Coming Events

SHOWS

Nov. 15-21 — New York, Automobile Salon.

Nov. 16-18—Chicago, Products Show, National Standard Parts Association.

Nov. 16-21—Detroit, First National Motor Bus Show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

Dec. 7-20 — Buenos Aires, 8th Annual Argentine Automobile Show.

Jan. 9-16—New York, N.A.C.C. National Annual Show, Grand Central Palace.

Jan. 18-23—New York, Twelfth National Motorcycle, Bicycle and Accessory Show, New Madison Square Garden.

Jan. 30-Feb. 6 — Chicago N.A.C.C. National Annual Show, Coliseum.

Jan. 30-Feb. 6—Chicago, Automobile Salon, Hotel Drake.

CONVENTIONS

Nov. 9-14—Chicago, Automotive Equipment Association.

Nov. 16-18—Chicago, National Standard Parts Association.

Nov. 16-21—Detroit, Society of Motor Transportation Engineers.

Nov. 17-18 — Detroit, Michigan Bus Owners Association.

Nov. 17-18 — Chicago, National Association of Finance Companies.

Nov. 17-19—St. Louis, National Tire Dealers Association.

Nov. 18-21—Detroit, American Association of State Highway Officials.

Jan. 9-16—New York, Second World Motor Transport Congress, Roosevelt Hotel.

Jan. 21-22—Hotel Statler, Buffalo, N. Y., Winter Sectional Meeting, American Society for Steel Treating.

RACES

Nov. 26—Los Angeles.

S.A.E. MEETINGS

Sectional

Nov. 13-14—Philadelphia, Automotive Transportation meeting.

Nov. 17—Buffalo, Statler Hotel; Dinner, 6.30 p. m.; Meeting, 8 p. m.

Nov. 19—Cleveland.

Nov. 20 — Washington, D. C., Cosmos Club.

Nov. 20—Chicago.

Nov. 24—San Francisco, Engineers Club.

Dec. 10—Indianapolis.

National

Jan. 14 — New York, Annual Dinner, Hotel Astor.

Jan. 26-29 — Detroit, Annual Meeting.

Coming Feature Issues of Chilton Class Journal Publications

January 1—Automobile Trade Journal —National Shows Number.

January 7—Motor Age — National Shows Number.

January 14—Motor World Wholesale—New York Show Report.

February 4—Motor Age — Chicago Show Number.

February 4—Motor World Wholesale —Chicago Show Report.

February 18—Automotive Industries—Statistical Issue.

Motor Bus Show Lists New Entries

Firms Exhibiting Now Number Fifty-seven—Twenty-five More Expected

DETROIT, Nov. 10—The first National Motor Bus Show is to be held in Convention Hall here Nov. 16-21 inclusive; fifty-seven firms directly connected with the bus industry have signed for space. Before the opening day, at least twenty-five more firms are expected to have taken booths, bringing the total number of those that will exhibit up to approximately eighty-five.

Exhibitors not previously announced in *Automotive Industries* are as follows: Fitz Johns Body Co., Puro Mfg. Co., Denby Mfg. Co., Graham Bros., Reo Motor Car Co., Gotfredson Corp., Commerce Motor Truck Co., Dorris Motors, Inc., American National Omnibus Co. (Gray Mfg. Co.), Studebaker Corp. of America, Continental Motors, City of Detroit Department of Street Railways, Skinner Automotive Device Co., Timken-Detroit Axle Co., The Auto Body Co., Greenleaf, Inc., Bus Transportation Magazine, Michigan Highway Association, Cornelius T. Meyers, Black and Decker Mfg. Co., Christensen Air Brake Co., Bayness & Erentler, Nichols-Lintern Co., Better Buses Magazine, Taxicab Journal, Automotive Daily News, Detroit Automobile Club, Thompson Research, Inc., Yellow Jack-It Mfg. Co., Chilton Class Journal Co., Gruss-Detroit Co. (Cleveland Pneumatic Tool), Electric Storage Battery Co., Willard Storage Battery Co., The Six Wheel Co., The Steel Products Co., Michigan Replacement Parts Co., U. S. Rubber Co., The Texas Co. of N. Y., Rollway Bearing Co., Waukesha Motor Co., Ford Motor Co., National Cash Register Co., Clark Equipment Co., Long Mfg. Co., Ross Gear & Tool Co., Joseph Weidenhoff, K. P. Products Co., Ternsted Mfg. Co., Stromberg Motor Device, Lorraine Sales Co.

Ford Asks Estimates for Chester Plants

PHILADELPHIA, Nov. 10 — Plans have been distributed among a number of local builders and contractors for estimates on the new Ford Motor Company plant to be built in Chester, Pa.

The assembly plant will be of brick, concrete and steel construction, one and two stories, on a site 680 by 453 feet. Some of the other buildings to be erected at this time are power house, oil houses, car delivery building, pump house and alterations to present buildings on the site. The plans were prepared by Albert Kahn, of Detroit, and the estimates are due November 11.

Cleveland Car Show Best in Its History

CLEVELAND, Nov. 10—The demand for truck space in the Cleveland Automobile Show, Jan. 23 to 30, is far in excess of the space available, it was announced today by the exposition management. It was pointed out, however, that arrangements for allotting additional space for commercial cars is under way. Drawing this week for passenger car space revealed a condition similar to the condition faced by the commercial car exhibitors. From every viewpoint, this year's show is going to be the biggest in the fifth city's history.

British Would Put Import Duty on Cars

Manufacturers' Association Asks 33 1/3 % Tax on Commercial Cars

LONDON, Nov. 10—The British Motor Manufacturers Association has formally applied to the Board of Trade for the imposition of a 33 1-3 per cent import duty on commercial motors, under the Safeguarding of Industries Act. If the Board considers that a prima facie case has been made out, it will appoint a committee of enquiry, upon whose report the Government's attitude will depend. It is highly improbable that any decision will be made for five or six months.

The application is supported by the Commercial Motor Users Association, which originally favored the exemption of industrial vehicles from import duty, but is now satisfied that competition among British makers is sufficient to justify protection. The Manufacturers Association estimates that the increased sales resulting from the imposition of import duty would give employment to 50,000 more working people.

P. R. T. Negotiates for Taxi Company

NEW YORK, Nov. 12—William E. McGuirk, president, Yellow Taxi Corp. of New York, confirms reports that his company is negotiating with the Philadelphia Rapid Transit Co. for the sale of its Philadelphia taxicab properties.

AUTOMOTIVE INDUSTRIES
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Exhibits at N. Y. Salon Reflect Trend Toward Bolder Colors

Three and four color jobs, elimination of belt lines, colored fenders and roofs, continuation of varnish finishes are some outstanding developments of show.

By K. W. Stillman

A RIOT of color! Reds, greens, blues and yellows and all their many combinations have been used by the coach builders exhibiting at the Salon being held in the Hotel Commodore, New York, this week, to make the show the most colorful spectacle of its kind ever held. Three, four or more colors have been used on the same body in ground colors, moldings, striping, trimmings, etc., in a way which would have been thought revolutionary a few years ago. Coach builders have tried for individuality in their jobs, and, as far as general appearance is concerned, their object has been attained.

Ninety-seven cars are on display representing the work of 13 body builders and 19 chassis makers. Body builders displaying are: Brewster, Brunn, Derham, De Causse, Dietrich, Fisher, Fleetwood, Holbrook, Judkins, LeBaron, Locke, Rollston and Willoughby. Chassis exhibited include Amilcar, Brewster, Cadillac, Cunningham, Duesenberg, Franklin, Isotta-Fraschini, Lancia, Lincoln, Locomobile, Marmon, Maybach, Mercedes, Minerva, Packard, Pierce-Arrow, Renault, Rolls-Royce and Wills Ste. Claire.

Cabriolets or town cars were the most popular models for display, there being 25 of these shown. Limousines came next, with considerable numbers of coupes, sedans, roadsters and phætons—the latter being mostly of the so-called sport type.

A distinct trend is shown toward more originality in color effects. Many fenders are colored to harmonize with body colors, and colored tops are quite numerous. The upper structures have been given more color than ever before. In a number of cars the window frames are painted the same color as the body. Wheels, in many cases, are colored, sometimes in a harmonizing shade of the body color and sometimes in a contrasting color.

As might possibly be expected in cars whose owners can well afford to have them refinished frequently, varnish finishes predominate, although there are a number of pyroxylin jobs, either dull finish or polished, on display. Glossy finishes evidently are still in considerable demand.

An interesting development in body work is the treatment of belt lines and moldings on the Salon exhibits. Some body builders, notably Fisher, still keep to the double belt line in which the upper belt ends at the windshield, while the lower one extends to the radiator. A large number of other makers, however, have given the belt a different treatment, if not eliminating it entirely.

Several jobs extend the belt line into a raised panel over the top of the hood, ending in an arrow effect at the radiator, following the practice introduced in this country by Duesenberg several years ago. At least one builder follows this practice, but ends the raised panel at the rear of the hood. Many cars have the windows outlined in molding but use no horizontal lines. Either one or two lines of striping, usually in light color, are generally used on moldings.

Wire wheels are furnished as standard equipment on about 50 per cent of the cars shown with artillery type on 33 per cent and disk on the remaining exhibits. Although a considerable number of cars carry spares at the rear, an increasing number are utilizing the space directly behind the front fenders for this purpose. As mentioned before, black wheels are comparatively few, nearly all jobs having colored running gear. The fenders are much wider than before. This, of course, is due, to some extent, to the use of balloon tires, but many jobs are fitted with fenders wider than would be necessary under usual practices. Metal used for fenders is of much heavier gage than before.

Broadcloth Upholstery Still Predominates

Upholstery materials are varied, with broadcloth predominating. Leather in the soft finishes which have been developed by tanners for automotive upholstery are used considerably both in open and closed models. One car, a Pierce-Arrow, has fabric upholstery with leather binding and edges, the first time this practice has been used by American manufacturers.

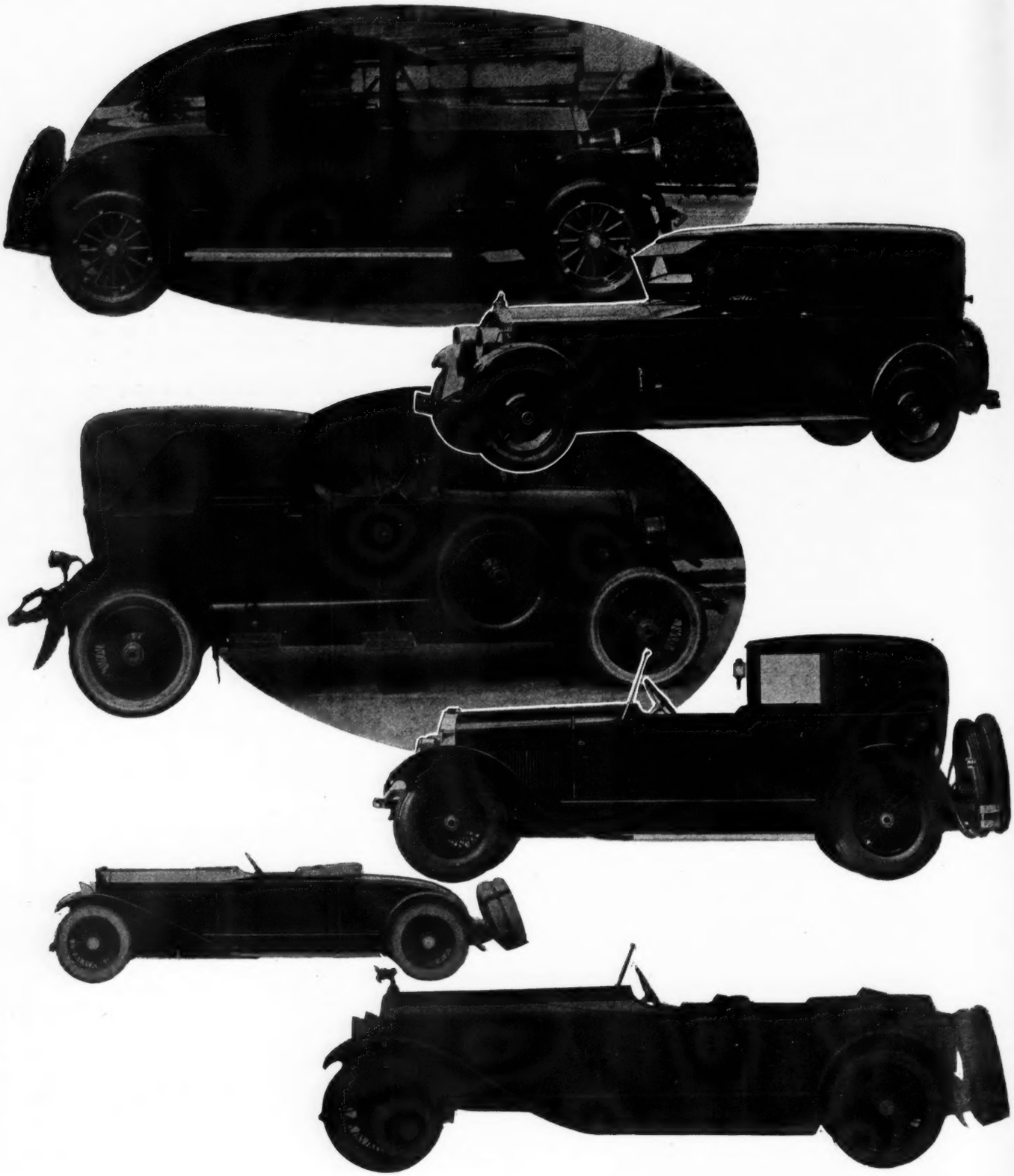
A number of coupe, sedan and limousine bodies are without outside sun visors, the roof ending abruptly and giving the job the appearance of a cabriolet or town car.

All the Cadillacs displayed have two interesting chassis features. Radiator shutters are painted the same color as the body. On either side of the body, just behind the front fenders, where many cars carry spare tires, is a box sunk into the running board. On one side the battery is carried and the other box serves as a tool container.

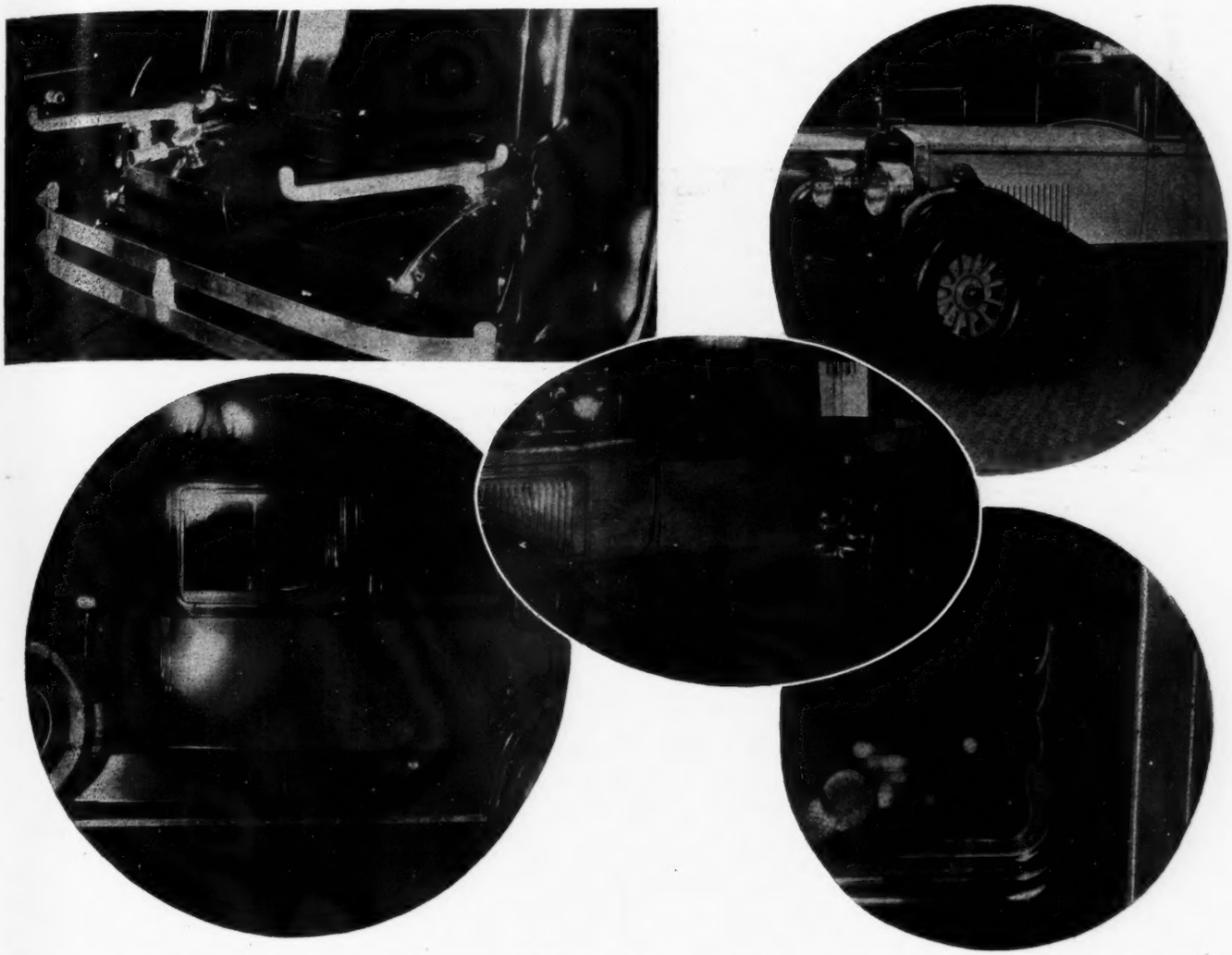
The use of several steps in the construction of the window frames is another feature used on a number of cars. This method graduates the jump between the thickness of the body below the window and the window itself, and makes a very pleasing change. In a number of cars the hood louvres are formed in a panel raised above the surface of the hood. Many of the louvres are striped.

Roadsters and the front doors of cabriolets are, in many instances, fitted with windows which can be lowered entirely out of sight. Side screens to operate with the front doors are furnished on many jobs. Nearly all cars are fitted with distinctive radiator caps, while heat indicators are placed on the instrument board.

Some New Models Exhibited



Upper Left: Two-passenger coupe by Judkins on Pierce-Arrow chassis. Upper Right: Limousine body by Holbrook; chassis by Packard. Center Left: Derham cabriolet mounted on a Packard chassis. Center Right: Lincoln cabriolet; body by Locke. Lower Left: LeBaron roadster body on Mercedes chassis. Lower Right: Isotta Fraschini five-passenger sport phaeton.



Upper Left: All Mercedes chassis are equipped with adjustable arms for holding trunks. Upper Right: This Cunningham limousine has a unique radiator cap and an unusual angle to the front fenders. Center: LeBaron sport phaeton on Cadillac has the door line broken by raised cowl. Note absence of through belt line. Lower Left: This Derham-Packard again shows the trend toward eliminating the usual belt line. Lower Right: Etched window design for Budd body on Mercedes.

Some idea of the beautiful and distinctive color effects may be obtained by a brief description of the finishes used on a number of different cars.

A Brunn-Cadillac cabriolet has wine-color body below the belt and same color for window frames. A vermillion belt ends in an arrow head at the rear of the hood. A Dietrich town car on Packard chassis is finished with bright green body and window frames, black molding and white striping. A Willoughby-Wills Ste. Claire town car is painted cerise with vermillion stripes.

A Willoughby coupe on Rolls-Royce chassis has light gray-blue lower body and fenders, darker blue upper structure and roof, dark blue molding with cream and red striping. A Fleetwood-Packard is painted entirely in brown with molding of darker shade and light colored stripes. Another Packard with a Rollston body has cream lower body and window framing, green fenders, wheels and roof, green molding ending in raised panel on hood and white stripes.

A sport phæton by Fisher on Cadillac chassis is painted a bright red with black molding, fenders and trim. A Holbrook cabriolet on Packard chassis is painted maroon with bright red wheels and black fenders. The lower part of the inclosed portion of the body is covered with wicker.

A Budd all-steel sedan body on a Mercedes chassis has several interesting points. One of the most noticeable is the narrow body pillars characteristic of this type of construction. This job has an all-steel roof with a very pronounced down sweep in front. The finish is quite unique, especially the treatment of the fenders. The outer edge of the fenders is black. Then comes a strip of dark green. An indented strip some three inches wide runs their entire length and is painted light green with vermillion striping.

In a LeBaron roadster on Mercedes chassis the body is cream with green fenders and green belt which ends in a raised hood panel and vermillion striping. A Cunningham limousine is painted a bluish gray with black fenders, cream wheels, black top and molding and light colored stripes. A Fleetwood body on Isotta-Fraschini chassis is painted gray-blue with cream striping below the belt and with the portion above the belt finished in polished aluminum.

A Rolls-Royce sport phæton is solid black below the belt line and polished aluminum above. A Minerva brougham has cream-colored body, green fenders, top and trim, black wheels and polished aluminum cowl and hood. Another Fleetwood body with Isotta-Fraschini chassis has blue body, window frames and wheels, black fenders, top and molding and polished aluminum hood.

An interesting body is shown by Brewster on a Rolls-Royce chassis. The windshield is divided vertically with only the left half adjustable. Instead of an outside sun

visor, an adjustable curtain mounted on a rigid frame is placed on the inside where it can be easily operated from the driver's seat. Leather has been used on the inside of doors for trim and also for facing the seats. The roof structure is open, this last item being also used on several other bodies. Adjustable front seats are furnished with the adjusting levers projecting between the seats.

Twelve Lincolns are shown, in all of which very striking color effects have been obtained. It is said that the color schemes used are based upon the work of Mother Nature, the master artist, and each car reflects the colorful plumage of a bird.

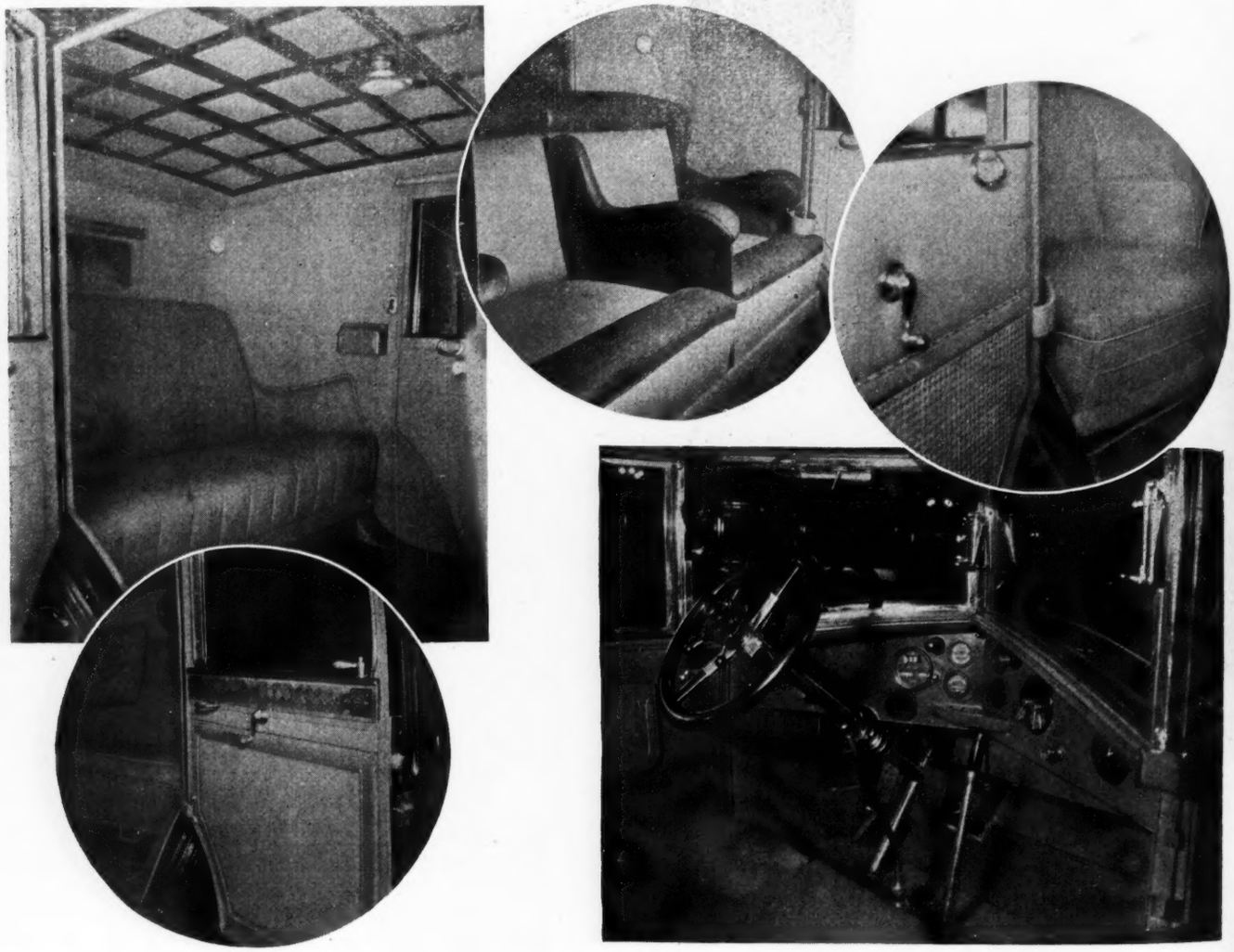
A Holbrook cabriolet gets its inspiration from the golden-headed trogon of Ecuador, and has bronze-green forward portion and wheels, a darker green with a suggestion of blue for the body, back of the coupe pillar, and scarlet striping. A LeBaron cabriolet with green body panels, bright red moldings and red and green dominant interior colors is patterned after the green tanager of Ecuador. The orange and black of the Brazilian oriole has been duplicated in a Judkins coupe with lustrous black body and brilliant orange striping, louvres and wheels.

Dietrich has expressed the colors of the purple-breasted chatterer of British Guiana in a cabriolet with purple-blue body and maroon molding, wheels and louvre striping. The American ring-billed gull has been duplicated by Brunn in a sport phæton by using polished aluminum body with black striping and moldings. A deep shade of blue-green, peculiar to the swallow tanager of Ecuador, is the basic color of a Willoughby landaulet. Black moldings and a white body stripe are the only departure from this color. Blue, blue-green, verditer and azure reproduced from the plumage of the Indian Roller from southern India has been used to decorate a cabriolet by Locke. A Judkins berline employs the light blue, black and dark blue found in the plumage of the merida jay of Venezuela.

A Victoria coupe by LeBaron, with light brown body and wheels, deep brown upper works and molding, and brilliant red body striping is patterned after the red chatterer cotinga of British Guiana. The cream and brilliant red of the yellow woodpecker of Venezuela has been used on a Brunn cabriolet. The Chinese Jay, colored with several graduated browns and blues, provided the motif for a four-passenger sedan by Dietrich.

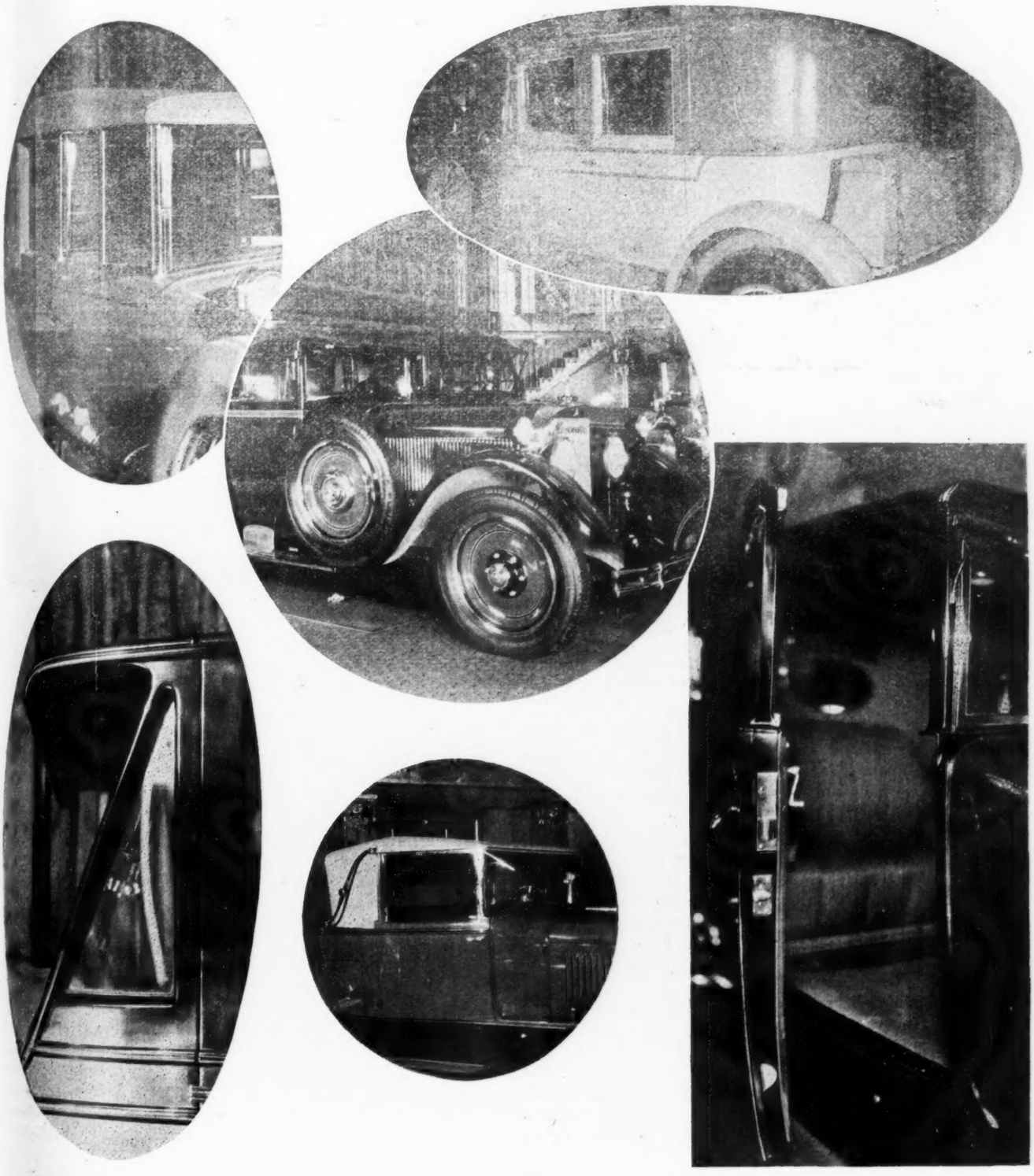
The color schemes have been continued through the interior trimmings and fittings, several fabric makers having reproduced in trimmings the exact shades of the bodies. The general effect of the cars are, therefore, quite striking, and possess individuality to a high degree. The color finishes are the product of the Ditzler Co.

All Mercedes cars shown are equipped with Rudge hubs with wire or wood wheels interchangeable. They also have

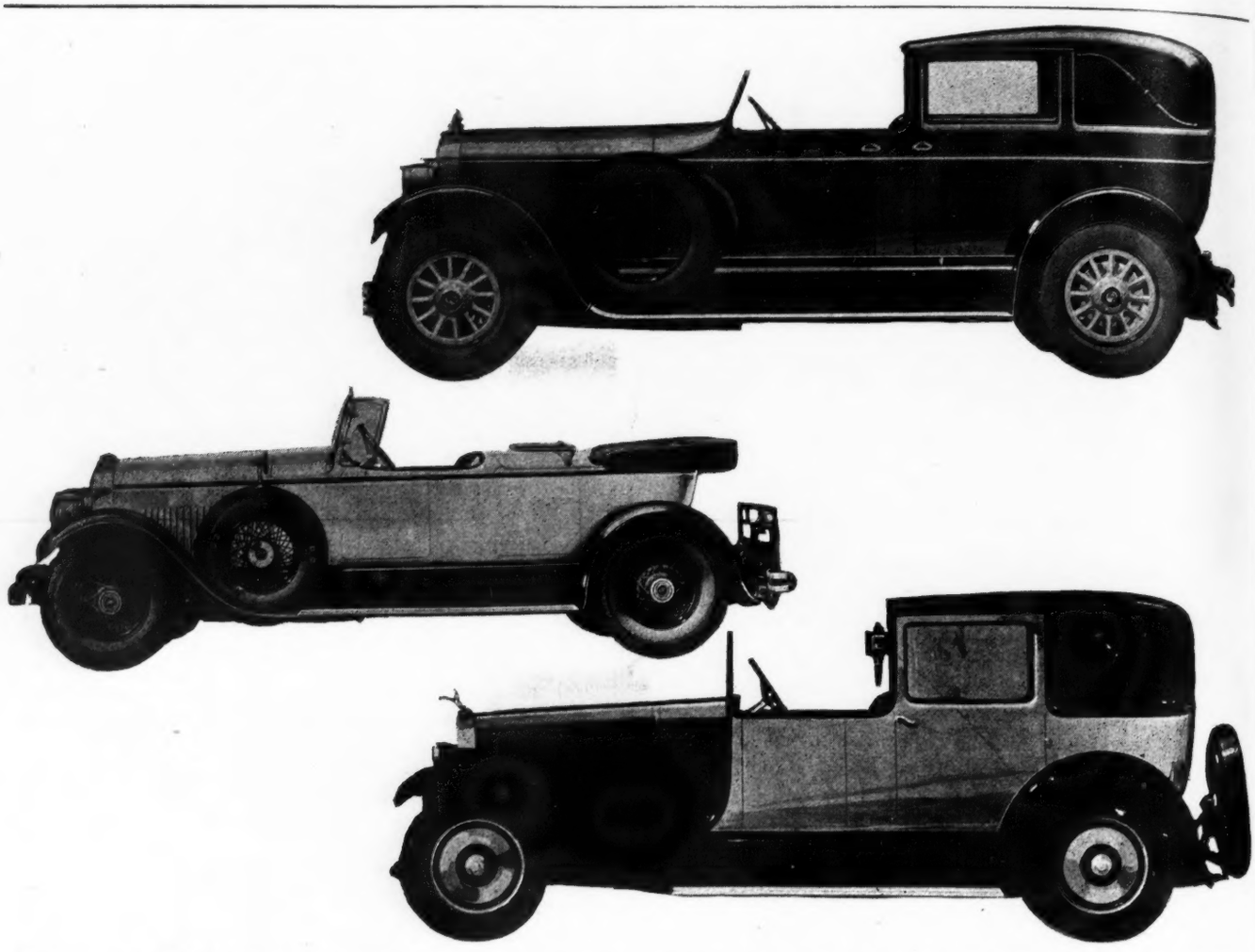


***Upper Left:** Wills-Ste. Claire with Willoughby body. Note skeleton roof construction. Also found on several other bodies. **Above Center:** Combination leather and fabric upholstery is used on this LeBaron body mounted on Pierce-Arrow chassis. Rear seats are divided by an arm rest. **Above Right:** Basket weave lower door paneling and natural wood finish molding is used on this Lincoln-Dietrich. **Below Left:** Isotta Fraschini with Fleetwood body. Note inlaid border under windows. **Below Right:** Interior view of Locke body on Rolls-Royce showing V-type windshield and peaked cowl*

Some Detail Developments in Design



Upper Left: This Locke body on a Rolls-Royce has collapsible roof and swinging side windows. Upper Right: Fleetwood body on a Duesenberg has an interesting treatment of the belt line at the rear. Center Above: This Budd body on Mercedes chassis has an all-steel roof with pronounced downsweep in front, the typical narrow body pillars and unique use of colored molding on the fenders. The effect of the last can be seen on the left front fender. Below Left: The sun visor has been given a little different treatment in this Marmon-Judkins. Below Center: This Brunn coupe for a Cadillac chassis has collapsible top and lowering windows. Note the absence of a belt line. Below Right: The narrow body pillar and door frame construction used on this LeBaron-Lincoln has been used also by several other builders. Note the abrupt termination of the roof line caused by elimination of outside sun visor. This feature appears on several cars to give a town-car effect.



Above: Cabriolet by Dietrich for the Marmon custom line. Below: Wills-Ste. Claire with cabriolet body by Willoughby Center: Polished aluminum sport phaeton by Brunn on a Lincoln chassis.

a novel trunk-supporting device consisting of two movable arms which, when swung out at right angles to the rear of the car, furnish a strong support to which the trunk is fastened by quick-acting thumb screws, and which when not in use can be folded in out of the way.

On a Rollston cabriolet body on Packard chassis the belt is extended as a raised panel over the top of the hood, but when the panel reaches the radiator it is swept down on each side to form a molding between the hood and the radiator. On this same car the permanent roof is extended slightly beyond the partition, and the space thus provided utilized for storing the rolled-up storm roof for the driver's compartment.

Considerable effort has been expended, apparently, in an attempt to decrease the size of body pillars. De Causse bodies on Franklin chassis have a front door and body pillar arrangement which is noticeably narrower than is ordinarily found in composite body construction. Much the same end has been achieved by several other builders, the bodies by Brewster being particularly satisfactory in this respect.

Although some attempt has been made in the past to have the upholstery match the body colors, much greater progress is evident in this direction this year than ever before. Some of the colors with which bodies are painted must have been particularly hard to duplicate in fabrics, but with few exceptions all upholstery either matches or is in very close harmony with the principal body color used.

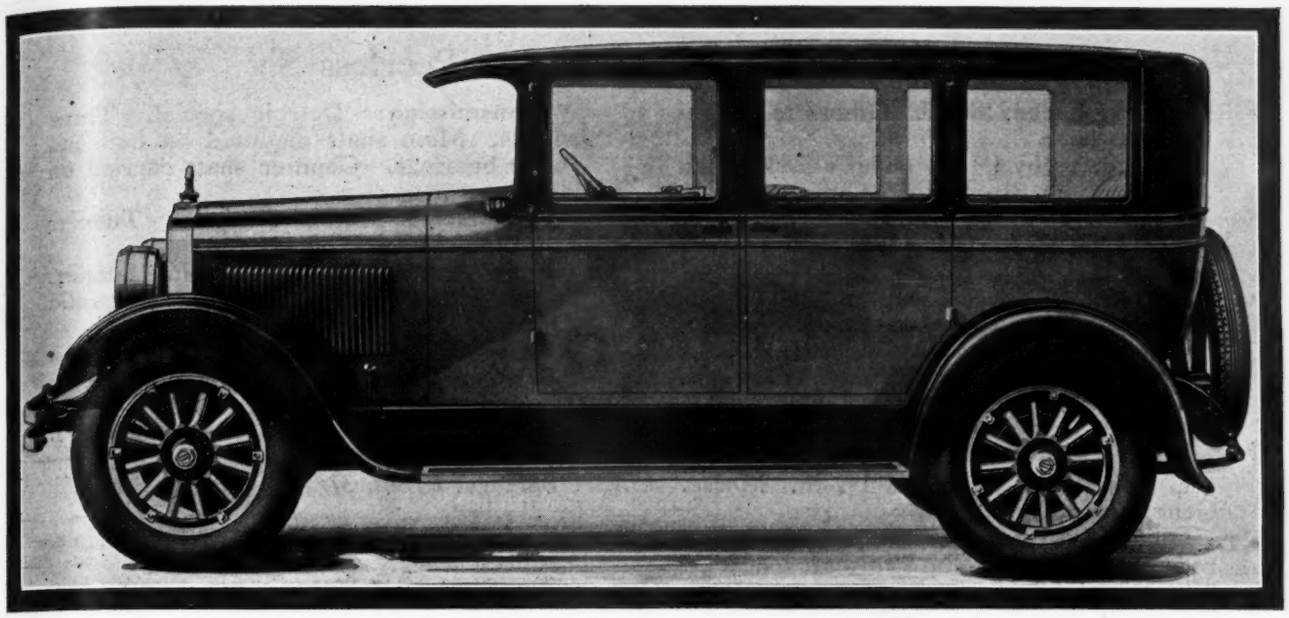
An increasingly large number of body builders are dividing their rear seats and are placing an arm rest in the center so that two passengers are all that can be carried there. In some instances these separators are removable, but more often they are stationary.

The elimination of full-length belt lines has given body designers more latitude in curving their rear quarters and window moldings. Several cars have noticeably wide and deep rear quarters, which extend in some cases as much as two or three inches below the position usually taken by the belt.

The front compartment of a Locke body mounted on a Rolls-Royce chassis is rather unique. This body has a V-type windshield, and the shape of the compartment carries out the shape of the windshield. This body is what might easily be called an all-purpose body. It is equipped with a full-length top and glass windows so that it can pass as a sedan. A glass partition can be raised between the front and rear seats to convert it into a limousine. The top is collapsible, so that with little work the body can be made into a phæton.

On a cabriolet body built for a Lincoln, Dietrich supplies wicker work for the lower door panels inside. The finish molding on this car is in natural wood.

A number of cars have inlaid moldings on the inside of the doors and windows, some of the designs being very intricate and beautiful. As mentioned before, in several cars displayed the inner roof lining has been eliminated and the roof timbers have been varnished or painted.



First of the new Peerless models, the Standard Sedan, listed at $1595

New Peerless Six Has 230 cu. in. Engine and 116 in. Wheelbase

Will be offered in six body styles with top price of $1595 for Standard sedan. Four-wheel hydraulic brakes, Lanchester dampener and Purolator among features. Weight is 3310 lbs.

By Leslie S. Gillette

PEERLESS MOTOR CAR CO. enters the medium-price field this week with a new six-cylinder model with a 116 in. wheelbase, employing a 3¼ by 4⅝ in. L-head engine, and weighing, fully equipped, with sedan body, 3310 lb.

Eventually the new model, known as the 6-80 Series, will be offered in six body styles, but at present production is confined to a Standard four-door sedan. It is planned to announce the other body models at monthly intervals and to have a four-door close-coupled sedan and a two-door sedan ready for exhibition at the coming national automobile shows.

The Standard sedan now in production will list at $1,595. Early in the new year a three-passenger coupe will be ready, followed by a three-five passenger sport roadster. The remaining model will be a five-passenger touring car.

Prices for the other body styles have not yet been set, but it is understood that they will be lower than that of the Standard sedan.

Peerless heretofore has produced a larger six and an eight-cylinder model, and these lines will be continued.

The new models closely resemble the larger six in general appearance while the chassis is of conventional layout. The frame depth is 7 in. which is unusual for a car of this size. The seven-bearing engine is assembled with the single-plate clutch and three-speed transmission into a unit powerplant, which is supported on the frame at four points. A propeller shaft with metallic universal joints at both ends transmits the drive to the semi-floating rear axle, which provides a gear ratio of 4 5/11 to 1. Lockheed four-wheel hydraulic brakes and 30 by 5.77 in. balloon tires are standard equipment.

Exceptionally easy riding qualities are claimed. The acceleration is also said to be unusual, while the car is credited with a high speed of better than 70 m.p.h. and a speed of 42 m.p.h. in second gear.

Although designed by the Peerless staff, the engine is manufactured by the Continental Motors Corp. With a piston displacement of 230.2 cu. in., the new powerplant develops 68 hp. at 2800 r.p.m. The torque curve peaks at 1100 r.p.m., at which speed the torque is 149.5 lb. ft. A new type of high turbulence combustion chamber and special valve timing contribute to the high output of the engine.

Cylinders Cast With Crankcase

The cylinders are cast together with the crankcase, which latter extends 2⅞ in. below the axis of the crankshaft. The detachable cylinder head is secured by 22 steel studs. Each of the seven main crankshaft bearings is held in a heavily ribbed bulkhead. The carbon steel crankshaft is of massive construction, having 2⅜ in. main journals and weighing 54¾ lb. Lengths of the bearings, in inches, are as follows: Front, 1 25/32; intermediate, 1¼; center, 1¾; rear, 2 13/32.

A Lanchester vibration dampener is mounted on the for-

Major Characteristics of New Peerless Six

Prices: Sedan, $1,595. Others to be announced later.

Engine: 3¼ by 4⅝ in. 68 hp. at 2800 r.p.m.

Carbureter: Stromberg. Outlet size 1¼ in.

Electrical Units: Auto-Lite with U. S. L. battery.

Crankshaft: Seven bearings. 2⅜ in. dia. Crankpins 2⅛ in. dia. Lanchester vibration dampener.

Pistons: Cast iron with 3 rings above pin. Pin 1 in. dia.

Valves: Interchangeable. Head dia. 1⅝ in. Stem dia. ⅜ in.

Camshaft Drive: Special 1¼ in. Morse. Generator adjustment.

Oiling System: Pressure to connecting rods, main bearings and camshaft bearings. "Purolator" oil filter.

Clutch: Borg and Beck. Single plate. 9⅞ in. dia.

Transmission: Detroit special. Three speeds. Main shaft mounted on ball and roller bearings. Counter shaft carried on bushings.

Universals: Metal, oil-tight. Tubular propellor shaft 2 in. dia.

Rear Axle: Columbia. Semi-floating. Spiral bevel. Hotchkiss drive. Gear ratio 4.45 to 1.

Front Axle: Columbia. Inclined pivots.

Brakes: Lockheed-Hydraulic four wheels. Transmission brake.

Steering: Ross cam and lever. 18 in. dia. bakelite steering wheel.

Springs: Front, 37¾ by 2 in. Rear, 54¼ by 2½ in.

Tires: 30 by 5.77 balloons. Firestone rims. Artillery wheels.

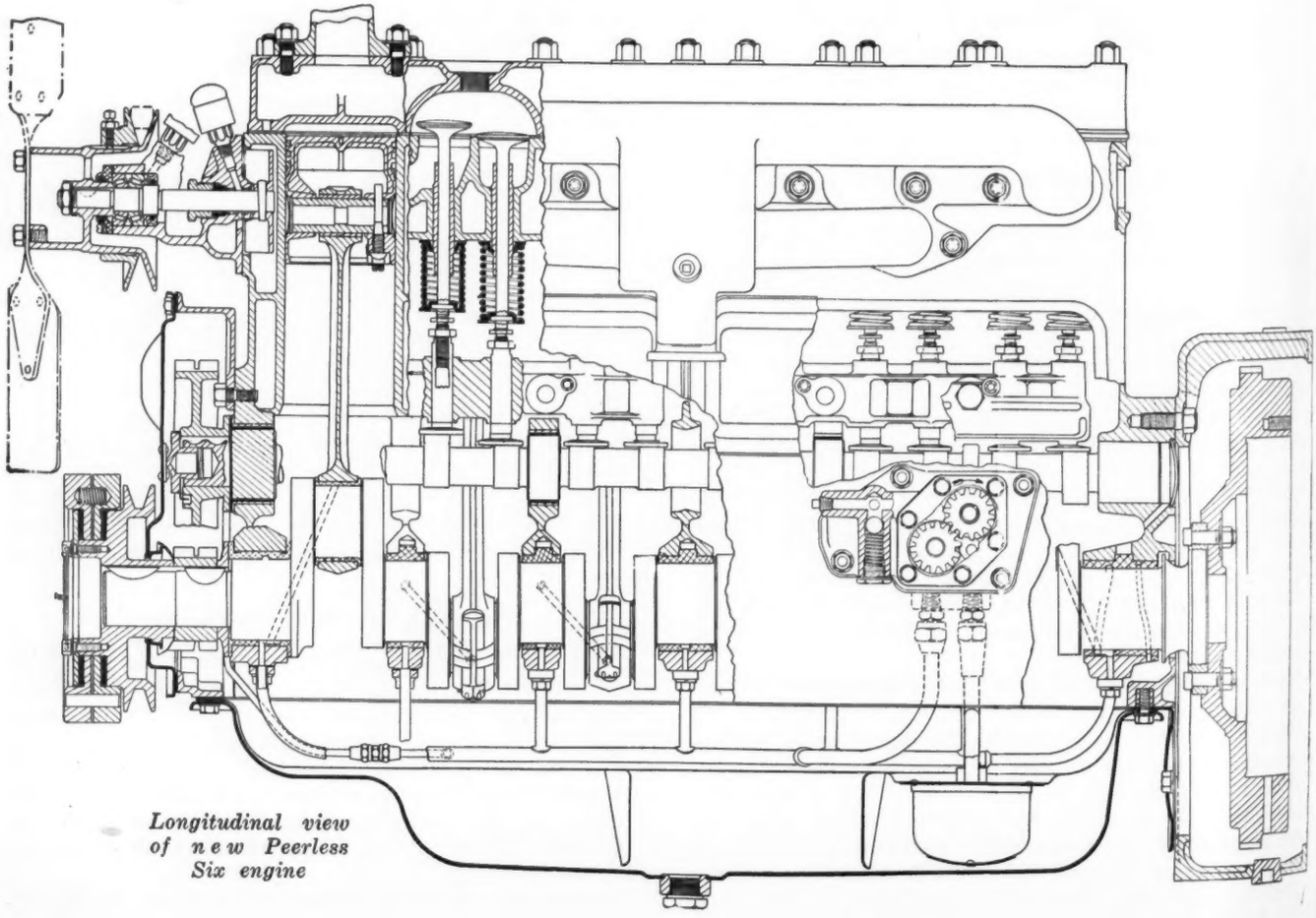
Wheelbase: 116 in.

Weight: Sedan fully equipped, 3310 lb.

Chassis Lubrication: Alemite system.

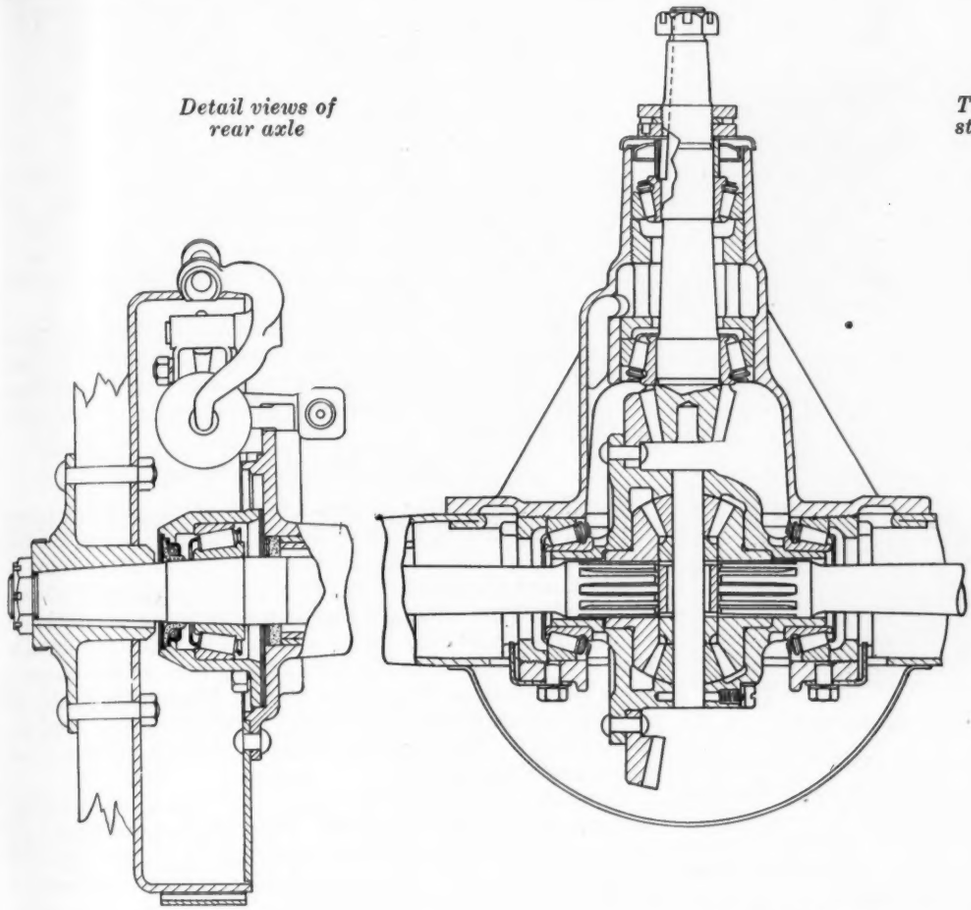
ward end of the crankshaft and the weight limits on pistons and connecting rods are held within one-half an ounce.

Connecting rods have a bearing diameter at the big end of 2⅛ in., with a length of 1⅜ in. The 1 in. piston pin is produced from solid bar stock and is locked in the piston by a set screw. An additional locking device in the form of snap rings at the ends of the pin is also provided. The length of the piston is 3¾ in., of which 2 5/16 in. is above the pin axis. Three 3/16 in. rings are used, all above the pin, the bottom ring being an oil control type of Drainoil brand. The weight of the piston and connecting rod assembly, with pin and rings, is 58 oz.

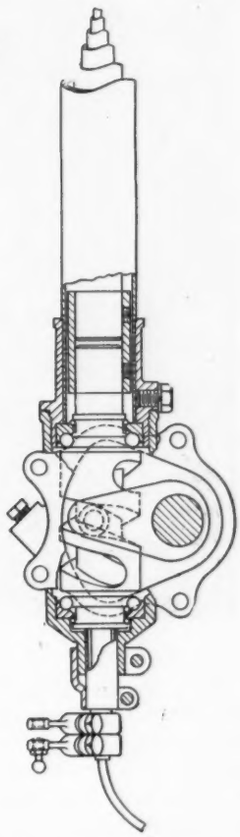


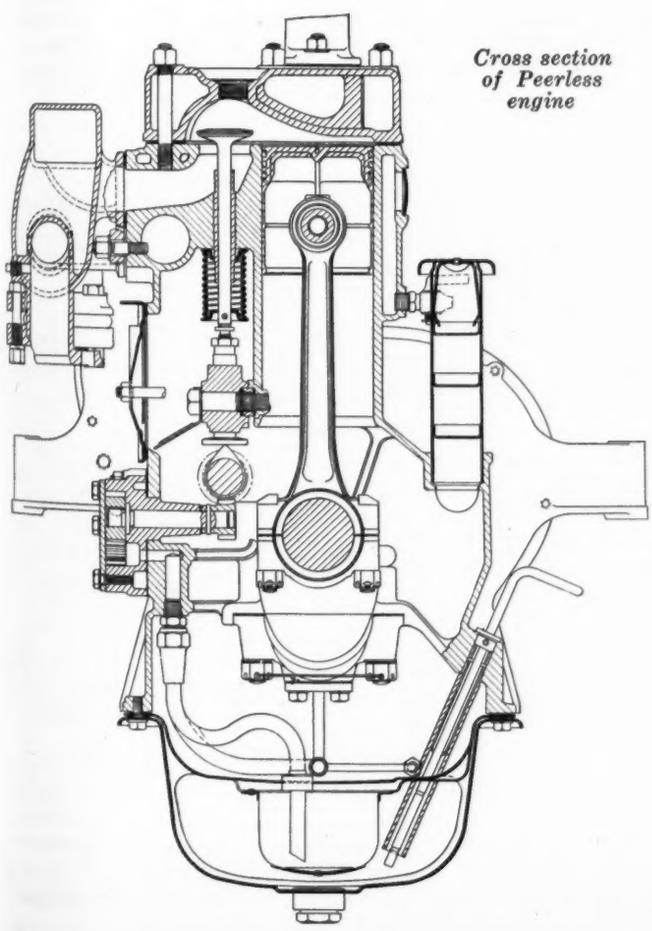
Longitudinal view of new Peerless Six engine

Detail views of rear axle



The Peerless steering post





Cross section of Peerless engine

A newly developed low pitch Morse chain, 1¼ in. wide, provides the front end drive for the accessories and camshaft. The latter is an alloy steel forging and runs in four bronze-back babbitt bushings of the following dimensions:

Front—2 1/16 by 1 11/32 length
Second—1 15/16 by 29/32 length
Third—1⅞ by 29/32 length
Rear—1½ by 1 13/16 length

Adjustment for the timing chain is provided for in the movable generator-ignition unit. The pressed steel timing case cover can be removed without disturbing the engine mounting.

By employing small cam flank radii the contact pressure between tappets and cams is said to have been lowered and the engine rendered more quiet. Mushroom type tappets operate the valves, which have nickel steel heads and open hearth steel stems. Both valves are interchangeable, the head diameter being 1⅝ in., the length 4 45/64 in., stem diameter ⅜ in. and the lift 21/64 in. Tappet guides and tappets are removable as a unit without disturbing any other part of the engine.

Located outside the crankcase near the carbureter, the oil pump is driven by helical gears off the crankshaft. This pump incorporates the oil pressure relief valve in the same casting, the unit being secured to the crankcase by four bolts. By removing six additional bolts, the pump cover may be detached, exposing the spur pump gears.

Oil Pump Easily Detached

Lubrication is by the full pressure system, oil being forced through tubing to each of the main bearings. All surplus oil drains back to the oil pan tray and is screened before entering the oil pan proper. There is another screen of circular shape over the pump inlet.

Peerless Six instrument board and controls

As a further guard against impurities in the lubrication system, a Purolater oil filter is bolted on the dash, the lead being taken off at the oil pump, where the tubing is connected for the pressure gage. The oil capacity of the crankcase at the "full" mark is 7 quarts, and the oil level is indicated by a graduated bayonet type gage.

A plain tube, cross throttle type of Stromberg carbureter, of 1¼ in. size, is bolted to the combined intake and exhaust manifold. The exhaust is carried down in front by a 2½ in. pipe which connects to a 28-in. welded, pressed steel, concentric type muffler, having a 1½ in. tail pipe. Fuel is delivered to the carbureter from the 15 gal. rear tank by a large capacity Stewart-Warner vacuum tank.

With the exception of the 6-8 volt U. S. L. battery, the electrical units are of Auto-Lite manufacture. The Starter has an S. A. E. mounting and an outboard type of Bendix drive employing an 11 tooth pinion. The generator is mounted on a separate bracket and is driven at 1 1/5 engine speed. On this same bracket is mounted the semi-automatic advance distributor unit, which is driven from the generator drive by helical gears. Either of these two units can be removed without affecting the other. The ignition coil and the cut-out also are mounted on the generator.

Fan and water pump are combined in a unit which is bolted to the front of the cylinder block. The fan itself runs on two taper roller bearings with the extension of the shaft carrying the water pump impeller passing through a packing nut and supported in a large phosphor bronze bushing. A ⅝ in. "V" belt provides the drive for the fan-pump unit and is adjusted by a movable flange on the fan pulley. The fan itself is 16 in. in diameter and has four blades. The radiator is of the cellular type and similar in design to that on the larger six. The capacity of the cooling system is 3½ gallons.

Between the transmission and the engine there is a single-plate dry disk Borg & Beck clutch of 9⅞ in. outside diameter. Means of adjustment are provided at two accessible points. The ten spline 1½ in. clutch shaft is supported in roller bearings at both ends and carries a graphite throw-out collar requiring no lubrication.

The gearset, which is manufactured by the Detroit Gear & Machine Co., provides three forward speeds and one reverse, of the following ratios:

Low—3.11 to 1
Second—1.70 to 1
Third—1.00 to 1
Reverse—3.78 to 1

Located above the main shaft and placed to the rear of the ball bearing is the helical-gear speedometer drive. At the rear of the gearcase is the transmission brake, which serves as an emergency brake and has a drum 7 in. in diameter by 2 in. wide. An approved lock is built into the transmission case.

A 2-in. tubular propeller shaft with oil-tight, metal universal joints transmits the power to the semi-floating Columbia make rear axle, designed for the Hotchkiss form of drive. A standard gear ratio of 4.45 to 1 is provided for all body models.

Lockheed Hydraulic Brakes

Lockheed hydraulic brakes of the external contracting type, having drums 14 in. in diameter and 2½ in. wide, are used on both axles. The thickness of the friction lining is 5/32 in. and the width 2 in. Brake anchors are set 45 deg. ahead of center, giving a three-quarter wrap on the brake bands. The front axle also is a Columbia. Steering knuckle thrust is taken by a radial ball bearing and a Ross cam and lever type steering gear is used. The gear ratio is 11½ to 1, while the turning radius in either direction is approximately 20 ft. The steering wheel is 18 in. in diameter and is formed of Bakelite.

Semi-elliptic springs are employed, those at the front being mounted above the axle while those at the rear are underslung, the dimensions being 37¾ in by 2 in. and 54¼ in. by 2¼ in. Exceptionally easy riding qualities are claimed for the new car, resulting in part from setting the spring shackles so as to make an angle of 45 deg. when the car is loaded. This is said to allow a very free movement of the flat springs. Heavy coil springs are placed on the shackle bolts to prevent rattle.

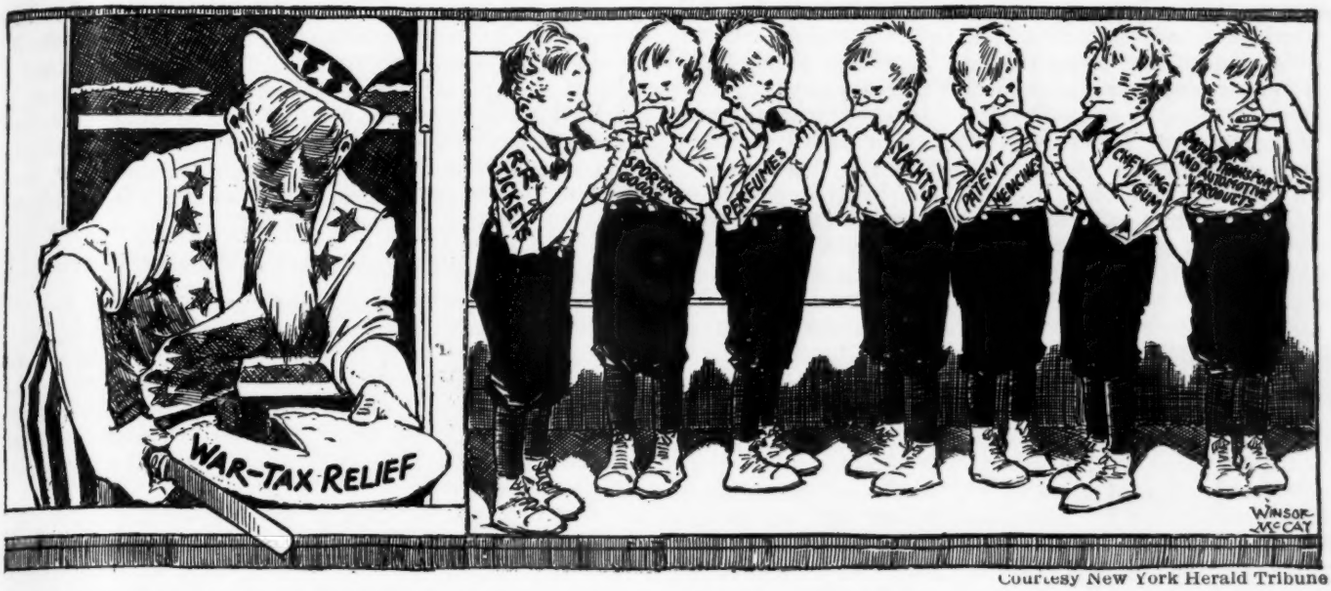
An unusually rugged straight tapered frame is provided. The maximum depth of the channel side members is 7 in., and the thickness of the stock ⅛ in. In addition to three pressed steel cross members there is a tubular brace at the extreme rear. The rear engine supports are bolted to mounting plates riveted to the frame, so the flywheel housing forms another frame cross member.

Standard tire equipment consists of 30 by 5.77 in. balloon tires, mounted on Firestone "A" rims attached to 12 spoke artillery wheels. Gabriel snubbers are used all around, while chassis lubrication is by the Alemite system.

Composite Bodies Used

All bodies will be of composite construction, with an exterior finish in three color lacquer and suitable striping. On the closed cars mohair plush will be employed for the upholstery; on the two open cars, Spanish leather. In addition to the usual dash instruments, which are mounted in a panel simulating the radiator design, a gasoline gage is installed. The following items are included in the regular equipment: Windshield wiper, rear view mirror, rear traffic signal, cowl lights, transmission lock, snubbers all around, foot rests and robe rail, besides a dome light and window shades on the closed cars.

The headlights, which are nickeled to correspond with the radiator, are fitted with special lenses and a single 21 c.p. bulb, with the dimmer control mounted in a combination switch on the metal dash. All interior hardware on the closed jobs will be given a bright and dull silver finish. Ready for the road, the Standard sedan weighs 3310 lb., of which 1715 lb. is on the rear wheels.



Courtesy New York Herald Tribune

About time he got his! While Uncle Sam has been giving tax relief to nearly all the other products which had to bear special excise burdens during the war, these Federal taxes still remain on motor vehicles, repair parts and accessories

"Take Off *All* the Federal Automotive Taxes," Industry Urges

Reductions approved by Ways and Means Committee hailed as encouraging sign, but only complete removal will Satisfy conviction that car is not luxury.

By Leslie H. Allen

REDUCTION of the excise tax on passenger automobiles from five to three per cent, as tentatively planned by the House Ways and Means Committee, is regarded by the industry as an encouraging sign that before both houses of Congress finish deliberations on the bill the complete removal of these taxes will be granted.

Nothing short of complete removal will satisfy the industry's conviction that, since the automobile is no longer a luxury but a necessity, it should not be subjected to such taxes.

The reported decision of the committee to recommend complete removal of excise taxes on trucks, parts, accessories and tires is hailed with satisfaction by the manufacturers of these necessities. The opinion is expressed generally that if the committee, as an initial suggestion, is disposed to go as far as this complete removal and a reduction of two per cent on passenger cars, it is not improbable that a further reduction will be made, especially since it is understood that the Senate Finance Committee is inclined to grant additional hearings on the subject when the bill reaches the Upper House.

Automobile taxes in 1925 amounted to $124,686,745. Of this about $94,000,000 represented the taxes on passenger cars and trucks. Reduction of the tax on passenger cars from five to three per cent would amount to about $39,000,000. What this would mean to buyers of passenger cars is indicated by the fact that all manufacturers who are members of the National Automobile Chamber of Commerce have agreed that whatever reduction in the passenger car taxes is finally made will be passed on to the purchaser. Complete removal of this tax thus would result in a saving to purchasers of new passenger cars amounting to an average of $29. If the five per cent tax is reduced only to three per cent the average saving would be $17.40. The tax on trucks is estimated to yield about $31,000,000, which in turn, if completely removed, would revert to purchasers, at least so far as members of the N. A. C. C. are concerned.

But it is more difficult to estimate the saving to consumers through complete removal of the tax on parts, accessories and tires. This tax for the fiscal year ending June 30 last amounted to approximately $23,000,000. The tax rate is two and a half per cent, to which it was reduced about a year ago from five per cent. At that time some of the manufacturers in this field, believing that the whole tax would be cut off in the not distant future, and for the purpose of increasing sales volume, reduced their prices about five per cent without further delay. Obviously the removal of the remaining two and a half per cent tax will have no effect on the price lists of these manufacturers.

Many manufacturers in the parts, accessories and tire field are doing business on such a small profit margin that they have been awaiting even a two and a half per cent tax reduction as a means of stabilizing their business.

The campaign for complete removal of automobile excise taxes is by no means ended or even retarded by the reported decision of the Ways and Means Committee to drop everything except a three per cent tax on passenger cars.

Representative Rainey of Illinois, a prominent Democratic member of the committee, still favors complete removal. He continues to contend that the American people would prefer complete removal to further increase of exemptions. This, he holds, is especially the attitude among farmers. He argues that automobiles now are a necessity rather than a luxury because they are filling a large place in transportation service, as evidenced by the passing of many short line railroads, the increase in bus and truck service, and, most recently, the plan of the Philadelphia Rapid Transit system to use taxicabs as feeders to its traction lines. It is understood that, if necessary, Representative Rainey will carry the fight for complete removal to the floor of the House.

Favorable Impression Made

That the representatives of the industry who appeared at the hearings before the committee created a most favorable impression there is no doubt. The committee members frankly admired the sincerity of the automotive leaders when they laid their pledges on the table to pass any tax reductions along to consumers. As a consequence the committee seems willing in reducing the automobile taxes to go further than Secretary Mellon had recommended. At least the members seem to realize the justice of spreading the reductions over all automotive classes rather than confining them to trucks, accessories and tires and permitting the passenger cars to carry on under the wartime basis of taxation.

Leaders of the industry continue to emphasize the fact that these taxes were adopted as a measure of national defense in the time of a national emergency and that to continue them now on the ground that the automobile benefits from Federal road aid would be a new departure in Federal policy which would be out of line with the history of the American government. Farmers are not taxed for the Department of Agriculture, nor shipping for river and harbor improvements, nor business for the Department of Commerce. Even should such a fallacious theory be admitted, the Federal government would still owe the automotive industry five years of Federal aid at $75,000,000 per year, because $863,000,000 has been collected in excise taxes and only $420,000,000 paid in Federal aid.

City, State and Federal Taxes

Stewart MacDonald, president of the Moon Motor Car Co., points out that the automobile today is one of the most heavily taxed articles on the whole taxation list. It is taxed by both the State and the City as personal property. It is also taxed by the Federal government, while gasoline, without which it could not function, is also subjected to levy. Mr. MacDonald holds that the automobile is sufficiently taxed otherwise to justify complete elimination of the excise levies.

That equity, not exigency, will be the guiding principle in the deliberations of Congress on this issue is the hope expressed by another prominent automotive leader.

"We feel that no House of Representatives can fail to regard the fairness of our $100,000,000 pledge," he said in an informal interview the other day. "Congress in granting tax relief quite properly wishes to benefit the ultimate consumer. The motor car and truck manufacturers did not quibble on this question. They came out flat-footedly with the pledge over the signature of each company that the delivered cost of the vehicle will be immediately reduced when the tax is repealed. This is square dealing. This guarantee would immediately lower the tax bill to the consumer to the extent of more than $100,000,000 and this fact must inevitably make a deep impression throughout the country.

"The fact that one has a just cause does not necessarily mean that it will immediately prevail. Anyone who listened to the presentations by E. P. Chalfant, president of the Motor and Accessory Manufacturers Association, by C. E. Gambill, president of the National Automobile Dealers Association, by Oscar Brown, representing the American Automobile Association, might assume that there was no possibility of these taxes being further continued —no justification for them was left.

Politics to be Considered

"But Congress faces political conditions.

"It is doubtless desirous to remove these taxes, but in order to do so it must be able to point to the urgent demand of its constituents.

"Here is where we owe it to these men and to ourselves to keep letting them know that we are with them and appreciative of their desire to see that these discriminatory levies are removed.

"The first pit-fall then is that of inertia.

"The next hazardous element of the situation is the attempt to associate these Federal taxes with the Federal Aid program. This argument is dangerous because it has the appearance of fairness before it is analyzed.

"Federal Aid for highways could be granted by the National Government only on the basis of general welfare.

"The Federal Aid act was passed in 1916 with no suggestion that this was a cause to which the motor vehicle should contribute.

"Motor vehicles are paying special taxes for highways into the State Treasury. Special State motor taxes alone amounted to $390,000,000 in the fiscal year 1925.

An Easy Tax to Collect

"Unfortunately one of the most powerful reasons why the taxes have remained thus far is that they are easy to collect and yield a considerable sum.

"This is a highly dangerous basis to accept in support of the taxes because it has no relation to justice. It is a doctrine of opportunism.

"It would be just as easy to collect taxes on locomotives, passenger rail cars, freight cars, trolley cars or steamships. If easy collection became a dominant principle of the government no group would be safe at any time from special levy whenever Congress might desire additional funds.

"It might be said here that while these taxes may be easy for the Government to collect, the imposts on parts, tires and accessories involve heavy costs to manufacturers and dealers in bookkeeping, auditing, etc.

"From the positive standpoint there are many reasons for the repeal of these taxes.

"They are discriminatory.

"They are a nuisance.

"They are a burden on transportation.

"The parts tax is a tax on misfortune.

"The industry at this time is familiar with these principles. Certainly they have been brought home by the actual cost in dollars and cents.

Public Anxious for Repeal

"The public, too, is increasingly saying that there is no ground for the continuance of these stigma taxes.

"Presentations recently made at Washington serve to outline these principles to the Ways and Means Committee and to exhibit our platform to the people of the country through the medium of the press which devoted a good deal of space to these hearings.

"The position of the automobile industry is sound.

"The Surplus permits this tax reduction, and the industry should hold to its principles without compromise."

Just Among Ourselves

Button! Button! Who's Got the Sales Effort?

AN entirely new model has been in preparation for some six months. The company has been in business for many years; it has good financial backing; it pays its bills. Its engineers have been designing, testing, trying out ideas and parts. The fact that the model is under way is one of those open secrets in the industry which most people you talk to know about. In all this time, according to a leading executive of this car company, only one manufacturer of a certain essential component has solicited his business. The same situation, he says, exists as regards several other units which he is going to buy outside his own plant. "Ask 'em to buy" is just as good a slogan in selling parts to factories as in selling spare tires to owners. Ask 'em to buy. Ask 'em to buy. Ask 'em to buy.

The "Public"—Which One Do You Mean?

AUTOMOTIVE engineers are being urged constantly to "give the public what it wants." They have been blamed for not doing so. But we've never heard any of the blamers define what is meant by "the public" nor trouble very much to explain how the desires of that mythical entity can be discovered. The public is not a fixed quantity. The group of individuals which comprise the public on one occasion, do not comprise it on the next. The public which determines public opinion as regards the desirability of having the Government fix wheat prices is composed for the most part of entirely different individuals than the public which determines public opinion as regards how high professors' salaries should be. Whether or not an individual is a part of public opinion on any particular issue varies directly with the interest of that individual in the particular question. Similar differences appear in public opinion as regards automotive designs. Different elements of the public buy motor vehicles for different reasons and from different financial standpoints. "The Public" as an entity is a phantom, just as an industry is a phantom in the sense described by Walter Carver in his recent article about relations between the automotive and the machine tool industries. Sales executives and engineers will get some interesting thoughts along this line from Walter Lippman's new book called "The Phantom Public." It deals with political and social opinion rather than with industry, but the applications are much the same in either case.

Nails, Brakes and Reckless Drivers

HAVE you had your brakes tested? Don't be touring around Constantinople unless you have your car stoppers in good working order. The Constantiople police have a new and very practical way of curbing reckless drivers and incidentally of testing brake efficiency. They throw across the path of an oncoming car a board filled with nails. If drivers cannot check their machines in time they not only suffer loss from punctures, but are conducted to repair stations by police who see that the brakes are properly adjusted or else confiscate the cars. Along with this report comes the statement that there are only 1,294 automobiles in Constantinople despite its 700,000 population. Well, that's not so surprising.

Coordinated Transportation—Who Will Do the Coordinating?

CURRENT efforts of the Mitten Management in Philadelphia to take over taxicabs as well as the surface lines, elevated lines and buses, which it already operates, bring out an interesting difference of present attitude between street railway and steam railway interests. In the Mitten case, for example, a street railway organization is asking for complete responsibility for providing transportation to the public within the area covered by its interests. It not only is willing to accept the responsibility; it is seeking it. The railroads up to the present time usually have taken the stand that operation of trucks in terminal service or in short haul work should and can be coordinated with the steam railways, but that the railways should not take the responsibility of such operation. The desirability for coordination of all forms of transportation seems to be agreed by everybody today.

Axle Designers Meet New Problems in Bus Work

AXLE designers seem likely to have some new problems to solve in the next few years if many States follow the lead of Florida and the Carolinas in legislating narrower bus widths than have been common in the past. The law in most States permits a width of 96 inches, but Florida has passed a law limiting bus width to 84 inches, while the limit in North and South Carolina is 86 inches. These narrower widths call for different axles than those used on the wider types of bus and present special design questions. It is important that those questions be answered adequately because there is undoubtedly a fairly strong feeling in a good many States that the big buses take up too much room on the road. That feeling is likely to increase rather than decrease as the number of buses becomes greater. The distance between the existence of such a feeling and its enactment into law is great, to be sure; but the existence might as well be recognized just the same.—N. G. S.

S. A. E. Probes Bus and Truck Problems at Transportation Meeting

Standardization urged in manufacture of equipment and in laws governing operation. Freight handling by trucks is pronounced a success. Six wheel and gas-electric buses prove their worth.

REGULATION of interstate motor vehicle traffic must come but it should be undertaken by the States, with the privilege of appeal to a Federal body, such as the Interstate Commerce Commission, when individual States are unable to agree on a solution for their mutual problems.

Traffic congestion, particularly of trucks, must be relieved if this type of transportation is to become the important factor in national life which it deserves. The relief may take the form of privately constructed highways, consolidation of freight terminals in congested areas, use of viaducts to carry truck traffic in and out of cities, or some other plan which may appear to be revolutionary at present but which must be carried out in the near future if truck manufacturers are to obtain the fullest possible utilization of their products necessary to continued sales.

Six wheels and gas-electric drives have not been in operation long enough to permit accurate evaluation of their worth in comparison with other types of motor vehicles, but from data now available they both have certain advantages over other types and as their development progresses they should take an important place in the field of automotive transportation.

These are the oustanding ideas brought forward at the S.A.E. Transportation Meeting held in Philadelphia, November 13 and 14, one of the best attended meetings, incidentally, that the society has ever held outside of its annual gatherings.

The first session, held on Friday morning, was on Standardization. Three papers were presented, each giving the views of one of the interested parties in all standardization of motor vehicles. E. W. Templin, of the Six Wheel Co., represented the manufacturers; H. F. Fritch, of the Boston & Maine Transportation Co., represented the operators, and R. B. Stoeckel, Commissioner of Motor Vehicles, State of Connecticut, represented state regulatory bodies.

Standardization Desirable

The concensus of opinion was that standardization is desirable, not only in design and construction of motor trucks and buses but also in regulation of interstate and intrastate traffic. Mr. Fritch stated that his company has found it possible to adhere very closely to manufacturers' standard designs when purchasing buses, and he believes that wide adoption of this policy will not only reduce first costs of buses but will give manufacturers more opportunities for real development work in improving designs rather than taking much of their time in making slight alterations on existing designs to meet the desires of individual customers.

Guy C. Hecker, special engineer of the American Electric Railway Association, suggested that manufacturers of

R. B. Stoeckel, commissioner of motor vehicles, State of Connecticut, who discussed pressing motor vehicle problems from the viewpoint of a State

H. F. Fritch, Boston & Maine Transportation Co., described the relationships of the motorcoach and the railroad and touched on influences of standardization

The manufacturer's attitude toward standardization was explained by E. W. Templin, of the Six Wheel Co. He thinks bus operators are getting the makers' point of view

A. F. Masury, of the International Motor Co., toastmaster at the Transportation Banquet Friday night

buses agree to make no changes in their standard designs for a period of one year. This would permit them to attain real production and he believes that consideration of proposed changes for a considerable time would make many of them unnecessary. He also thinks that standard accounting methods should be adopted by bus operators so that accurate comparisons of cost data might be made to everyone's benefit.

Mr. Templin said that many of the special features or changes in the standard designs of bus manufacturers are unnecessary and not only increase the cost but often make the value of the bus as a whole somewhat less than it was before the changes were made. He believes that the entire picture presented by the complete bus as an operating unit should be considered when changes are in view. When the problem is viewed in this light many of the desired changes prove to have so little effect on the general utility of the bus as to make them undesirable even if the costs and time required for delivery were not increased by adopting them.

It is his belief that bus manufacturers are so situated that they can learn what is required of buses for various services and can develop standard designs which will prove satisfactory under most conditions. This belief has been substantiated, he said, by the fact that most requests for changes come from new-comers to the bus operating field while established operators usually are satisfied with standard designs.

In connection with his paper, Mr. Templin showed several charts and lists of the changes most often requested and emphasized the fact that most of them were for minor details which would make very little difference in the bus if the original design was according to modern practice.

During the past six months, it seemed to him, the demand for changes has been decreasing and he expects that bus operators are learning that bus manufacturers are vitally interested in developing buses of standard design which will give satisfactory service and that they can accept standard designs with no fear that they will not meet operating requirements.

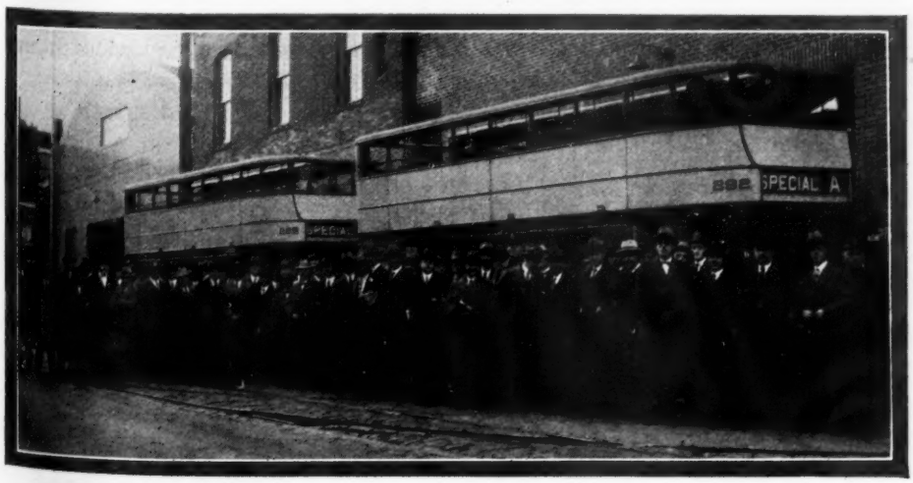
A Duty to the Public

Mr. Fritch emphasized the fact that although railroads have a very large investment in rail equipment which they naturally wish to use to the fullest extent, the roads owe it to the public which they serve to use motor vehicle transportation in conjunction with, or in substitution for, train service wherever sound economics justifies it. The Boston & Maine Railroad is using motor vehicles, where it seems reasonable to believe it may be done to advantage, to determine through experience what the proper field is for the motor truck and the motor bus in connection with railroad operation.

Motor buses will be used to replace train service, as a supplement to rail service between trains, as a feeder to rail lines from new territory, as a feeder along main lines serving local stops and as a touring service to care for pleasure travel. Some of these applications have already been made and the others will be placed in operation soon. The results of last summer's operation of bus lines by the Boston & Maine show that in some cases railroad operating losses can be eliminated by the substitution of buses with adequate and, in some instances, improved service being provided.

Two Types of Equipment

The equipment used by the Boston & Maine is of two general types—interurban for short hauls and de luxe for long hauls. In purchasing bodies and chassis to meet the particular service requirements it has been found possible to conform closely to manufacturers' standards even while taking care of some special requirements made necessary by operation as a railroad auxiliary. Attractive-



All aboard for the inspection! Members of the S.A.E. and their guests at the Transportation Meeting ready to start on the inspection of the plant and equipment of the Philadelphia Rural Transit Co., which was a feature of the Saturday program. In the oval is C. O. Guernsey, chairman of the Inspection Visit Committee

Major Elihu Church, of the Port of New York Authority, thinks that motor trucks some day will operate across country over roads of their own

Charles Froesch, of International Motor Co., told about developments in the construction and use of unit containers for the handling of freight

ness and comfort through richness and simplicity rather than through frills, Mr. Fritch said, has been the policy of his railroad in buying equipment, since it was thought that these qualities appeal to the public as well as providing more economical maintenance.

Mr. Stoeckel stated that standardization of laws concerning motor vehicle operation is very difficult, chiefly because of the differences in the problems of the several jurisdictions. He believes that these differences are of degree rather than of subject matter—that practically the same problems are to be found in all localities but their relative importance is greatly influenced by the state of development of motor vehicle operation in the jurisdiction.

How Problem Must be Approached

For this reason, he said, all steps to provide uniformity of laws in different States must be predicated on the fact that the size of any particular problem to be considered depends upon the extent of motor vehicle operation in the States with the resultant growth of regulatory problems.

Standardization of equipment probably can be obtained if this phrase is interpreted to mean performance. It should be possible to standardize the *performance* of such equipment as horns, mirrors, number plate holders, etc., but uniformity can scarcely be extended to include the actual equipment.

The outstanding problems which are confronting State regulatory bodies at the present time, Mr. Stoeckel said, are:

1. State management of passenger-carrying buses, covering both interstate and intrastate operations.
2. The problem of highway wear and tear by large commercial motor vehicles, including loading and overloading, State regulations of maximum loads and ratios of load to rated capacity.
3. Speed on the highways, particularly in relation to the size and construction of the vehicles, including the determination of a reasonable road speed and proper restrictions of excessive speeds.

The session held Friday afternoon dealt with freight handling. In this session traffic congestion and regulation were the important topics. Major Elihu Church, of the Port of New York Authority, in discussing the traffic problems which confront large cities, suggested the use of viaducts built over existing rail lines as a means of providing trucking highways, with low gradients and small curvature, into the center of congested districts. In his opinion, freight in the future, not only in short hauls but in hauls up to 100 miles or more, will be carried on road vehicles and use will be made of tractors hauling long trains of trailers. More highways are necessary, he believes, and he sees the return of privately owned toll roads, inasmuch as taxation can not be raised to an extent which will make possible enough publicly owned roads as rapidly as they are required.

Trucks Have Speeded Deliveries

Joseph L. Scott, of Scott Brothers, told of the work his company is doing in connection with the Pennsylvania Railroad in handling less than carload freight by trucks throughout 469 towns situated in four States. He said that trucks have not only proved more economical than train service but deliveries have been expedited 24 to 48 hours.

Mr. Scott said that in 1923 his company was selected by the Pennsylvania Railroad to demonstrate the handling of less than carload freight by motor truck between Overbrook, Pa., and Downingtown, Pa., on its main line. This venture proved so successful that now Scott Brothers' trucks give an uninterrupted service to 469 towns in the States of Maryland, Pennsylvania, New Jersey and Delaware, and cover 1,348 railroad miles daily.

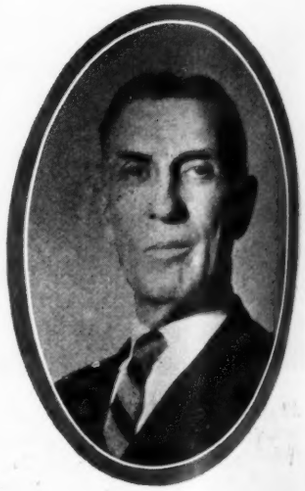
Truck delivery costs per ton mile vary, of course, according to the different territories covered, the range being from 3 to 10 cents. It was his conclusion that an economic haul for a truck is from 50 to 75 miles daily.

He believes that the future will see much better cooperation between truck operators and railroads than has prevailed in the past. This development, he said, would be based upon the establishment of more truck operating units which are financially responsible and equipped to render good service. Lack of such units in the past has been the main obstacle to a more rapid development of cooperation between the two transportation mediums.

J. W. Roberts, of the Pennsylvania Railroad, reported the result of his extensive investigations of British railroad methods of handling less than carload freight. The railroads provide store door delivery service, but a very large proportion of it is done with horse-drawn vehicles.

Charles Froesch read a paper prepared by himself and George McCall, both of International Motor Co., in which was oulined the field for unit containers and a description of the Mack unit container and methods for using it.

Considerable discussion at the end of the papers brought out the opinion, apparently general, that regulation of interstate traffic should be performed by the various States,



Store-door delivery of railroad freight is no longer a dream. How it is being developed was told by J W. Roberts, Pennsylvania Railroad

with recourse to a Federal agency such as the I. C. C., in case individual States were unable to reach an agreement on any question. It was thought that State bodies would be more conversant with the particular needs of the motor vehicle industry within their borders and so should be better able to provide effective regulation.

The Saturday morning session covered motorcoach operation and the two newcomers to this field—the gas-electric and six-wheel buses—were discussed by R. H. Horton, Philadelphia Rural Transit Co., and W. F. Evans, Detroit Motorbus Co., respectively, the paper prepared by Mr. Evans being read, in his absence, by Mr. Parker.

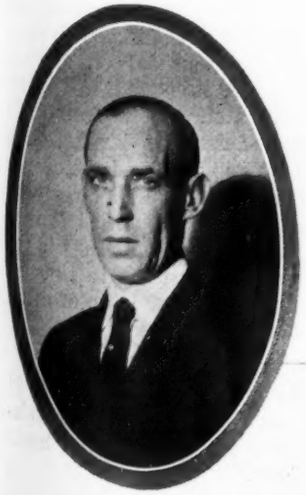
Mr. Horton's favorable comments on the value of gas-electrics were questioned by several persons during the discussion. There was doubt expressed as to whether this type of vehicle is really better than mechanical drive buses when consideration is given to its larger first cost and greater weight. It was the opinion of some that before any definite decision can be made more detailed information concerning cost and operating statistics is necessary in order to make accurate comparisons between gas-electrics and other types of drive.

Superiority is Questioned

Mr. Froesch said he believes the gas-electric drive is at its best in single-deck buses, because the greater ease of control is an aid to the driver in collecting fares. He also suggested that, since the gas-electric drive has advantages over the mechanical drive during the accelerating period but probably is not as efficient at full speed, some sort of dual system might be developed whereby the gas-electric drive could be used in getting the bus up to speed, and direct mechanical drive thereafter. Another suggestion was, that since much of the advantage claimed for gas-electric drive has to do with greater ease of control through elimination of gear shifts, some of the mechanical shifts now in existence might be developed for bus service.

The six-wheel type of chassis was generally regarded as a very important contribution to motor vehicle development, both for passenger and freight use. Vehicles of this type have been in service long enough to permit a fairly definite estimation of their worth, in comparison with four-wheel vehicles, and the concensus of opinion seemed to be that for heavy loads, whether of passengers or freight, the use of six wheels was more desirable than dual tires on the rear wheels and that considerable economy in maintenance costs and life of the vehicle, as well as easier riding conditions, was made possible by their use.

General Dalton, of the U. S. Quartermaster Corps, gave a very interesting talk on the Army Motor Transport service and he was quite enthusiastic over six-wheel trucks for use in the heavy service required of army transports. He said that the next war will be one of movement in which it will not only be necessary to move men and small guns often and quickly but that the very large pieces of armament must be mounted on movable carriages, and he sees in the six-wheel trucks a development which, as it progresses, may provide the necessary tractive effort to permit such heavy pieces to be moved readily over the highways.



Joseph L. Scott heads the firm which is delivering freight by truck for the Pennsylvania Railroad in 469 towns in four different States

R. H. Horton, Philadelphia Rural Transit Co., gave the experiences of his company in the operation of gas-electric buses

A. J. Scaife, White Motor Co., presided as chairman of the session which went into the subject of motorcoach operation

Load Well Distributed

Mr. Evans said that 37 six-wheel buses had been placed in operation in Detroit just one year ago, and that the statements he made were based on a year's operation which, while not long enough to demonstrate conclusively just what the operating characteristics of the buses are, was long enough to permit a fairly accurate estimate to be made. An interesting statement was made that at frequent times these buses had been loaded at random with loadometers under each wheel and at no time did the variation of load per wheel exceed 10 lb. It has been their experience that six-wheel buses are much less subject to skidding than four-wheel vehicles, so that all year around operation can be obtained with greater uniformity of schedules than has been possible before. Another important advantage is the increased braking power, and Mr. Evans stated that their buses have approximately one square inch of service brake area per pound of vehicle.

The outstanding results of their operation of six-wheel vehicles include lower maintenance cost because of the easier riding conditions provided by pneumatic tires and the better spring arrangement made possible by the use of tandem rear wheels; lower liability cost due to the evenly balanced load, non-skidding features and braking efficiency. In conclusion he stated his belief that the six-wheel type of construction has before it a tremendous future not only for passenger transportation but for the heavier truck loads, permitting these to be handled at greater speeds with less abuse to the vehicle and to the highways.

Mr. Horton said that his company has not been operating gas-electric buses long enough so that statistics could be presented to prove definitely all the things which they believe to be true of gas-electric bus operation. Some 130 buses of this type have been placed in operation and as this required virtually an entirely new operating and mechanical force to be employed and trained the present

The operation of six-wheel buses was the subject of an address by W. F. Evans, of the Detroit Motorbus Co.

results can not be taken as a true criterion of what can be done after a well trained personnel has been established. Present results have been such as to permit a fairly accurate estimate of actual conditions and Mr. Horton said that the points he brought out have been substantiated by operating results.

From the operator's viewpoint, the four major requirements of a bus are safety, reliability, attractiveness to the public and economy. In all of these, he said, gas-electric buses are proving fully as satisfactory as other types and in three of them gas-electrics might prove to be considerably better.

Mr. Horton believes that gas-electrics are the safest vehicles yet devised. The ease of control and the elimination of the gear shift makes it possible for the driver to give his entire attention to driving. The absence of a differential and driving of both of the rear wheels reduces skidding to a minimum and the electric brake for application in emergencies is a valuable adjunct when collisions are imminent. Boarding and lighting accidents are frequent causes of injuries to passengers owing to the jerk with which buses usually are stopped or started. With the gas-electrics the smooth acceleration possible has decreased this item considerably.

Inspections Every 4000 Miles

Reliability of a bus depends to a large extent upon its maintenance characteristics—the easier it is to maintain in good operating condition the more reliable will it be. Most bus operators have established the principle of a general inspection every 2,000 miles. The Philadelphia Rural Transit Co. has reached the point with gas-electric maintenance where in one garage an inspection every 4,000 miles will be made as the first step toward an even greater period in the future.

In preliminary tests it has been found that the gasoline engine with electric drive makes 20 per cent fewer revolutions than a duplicate engine operated on a mechanical drive, thus greatly decreasing wear and tear on the engine. It is a well known fact that maintenance of electric motors and generators amounts to but little more than periodic oiling and greasing. A slipping clutch is unknown and any rear axle trouble is confined to a simple worm and wheel instead of extending also to a complicated rear axle. For these reasons maintenance on gas-electrics has been found much easier than on mechanical drive vehicles with the result that their reliability in service is correspondingly increased.

Along with increase in safety and reliability the gas-electrics provide more economical operation said Mr. Horton. He did not base this claim on gasoline consumption, inasmuch as that is only one of the minor costs, although the consumption of the gas-electrics has been steadily decreasing due to the fact that the vehicles are being broken in and also to the fact that the drivers are being better trained to eliminate waste.

The principal economy is due to the higher schedules that can be maintained with the gas-electrics, resulting not from higher running speeds but from smooth and rapid acceleration. Gas-electric buses can not be accelerated more rapidly than other types of vehicles. In tests it was proven that mechanical driven vehicles can accelerate as rapidly as the gas-electrics, but because of the surge when gears are shifted and the strain upon the driver, it is impossible to accelerate a mechanically driven bus with such speed in regular service. With the gas-electrics there is no strain on the driver and there are no gears to shift so that maximum speed in acceleration is possible at all times with the result that schedules can be maintained at a considerably higher rate than is otherwise possible.

From the standpoint of attractiveness, Mr. Horton thought that the quietness and smooth and rapid acceleration of gas-electrics together with the attention given to body design makes them at least as satisfactory to the public as other types of bus with a possibility that, when their characteristics become better known, they will be preferred.

Speaking at the Transportation Banquet held Friday night, at which A. F. Masury, International Motor Co., was toastmaster, Samuel M. Vauclain, president, Baldwin Locomotive Works, predicted that it would be but a few years before trolley cars would be entirely replaced by motor vehicles on the streets of Philadelphia and other large cities. Other speakers included H. L. Horning who presided at the banquet, Dr. E. J. Cattell, Philadelphia Chamber of Commerce, and a representative of the Chamber who extended an invitation to the Society to hold its conventions next year in Philadelphia when the Sesqui-Centennial Exposition will be in progress.

Saturday afternoon was devoted to an inspection trip of the plant and equipment of the Philadelphia Rural Transit Co.

THE bulk of the aluminum produced at present is refined from bauxite, a mineral which derived its name from Baux, a town in the southern part of France, and which contains some 60 per cent of alumina. The production of one ton of finished metal requires the expenditure of some eight tons of coal, unless, as is generally the case, hydro-electric energy is used. In the extraction process, a 15 per cent solution of alumina, in fused cryolite (a complex sodium aluminium fluoride) is subjected to electrolysis. The furnace used is of simple rectangular construction, and is lined with carbon to form the cathode; the anodes are of amorphous carbon, and are suspended in the fused electrolyte. A furnace 8 ft. long by 4½ ft. wide by 2 ft. deep can carry a current of from 8,000 to 10,000 amperes, with a pressure drop of 6 volts. The working temperature is about 1,800 deg. F. and the carbon necessary to complete the reaction is supplied largely by the amorphous carbon anodes, the wear of which is very great. The molten aluminum, as it is formed, sinks to the bottom of the bath and is run off from time to time by means of a tapping hole. The production of 1 ton of metal requires some 25,000 kilowatt hours.

FIG. 6c shown on page 493 of our issue for September 24 is erroneously titled Common Sense Window Regulator. The device illustrated is the type KA regulator made by Perfect Window Regulator Corp.

Manifold Can be Designed to Offset Overlapping Exhaust Periods

Overlapping a common trouble with 8-cylinder engines as three cylinders are in exhaust period simultaneously, which permits spent gas from one cylinder to blow over into the other two.

By P. M. Heldt

IN the development of six and eight cylinder vertical engines trouble is sometimes experienced from the overlapping of exhaust periods. With average value timing for high speed engines, the exhaust valves begin to open about 50 deg. of crank motion ahead of bottom dead center and close completely about 10 deg. past top dead center, hence the exhaust period extends over 240 deg. of crank motion.

Now, in an eight cylinder engine the explosions come at intervals of 90 deg., hence the length of the exhaust period is two and two-thirds times the interval between successive explosions, from which it follows that two-thirds of the time three exhaust valves are open simultaneously and during the rest one-third of the time, two valves. These proportions would vary slightly with the valve timing, but they apply substantially to all modern high-speed engines.

The overlapping of the exhaust periods is clearly indicated in Fig. 1. In this diagram are shown the exhaust periods of the four cylinders of an eight cylinder engine which fire during one revolution of the crankshaft. Any radial line drawn from the center will cross either two or three of the arcs, thus showing that either two or three of the exhaust valves are open simultantously.

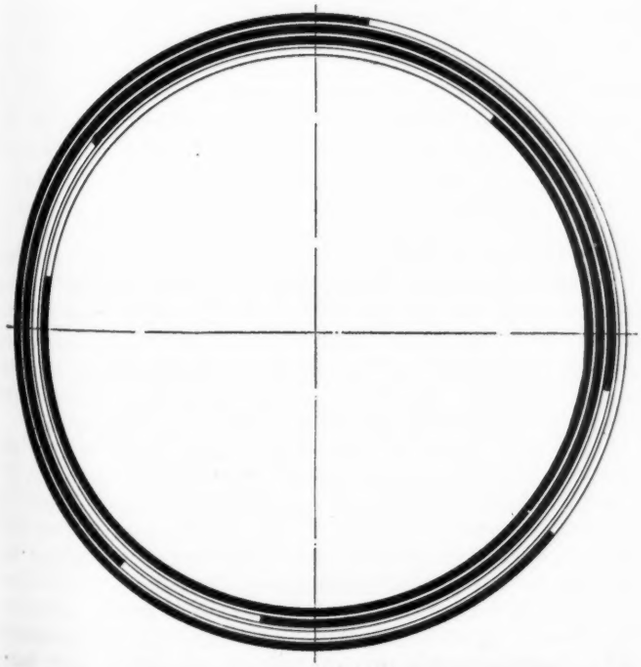


Fig. 1—Diagram showing overlapping of exhaust periods in eight-cylinder vertical engine

If an exhaust valve begins to open when the crank is still 50 degrees from the bottom dead center, then the crank of the preceding cylinder is 40 deg. past the bottom dead center, on its exhaust stroke, and the crank of the cylinder preceding this one, 50 deg. from the top dead center, also on its exhaust stroke. In both of these latter cylinders, of course, the pressure has dropped to a comparatively low value, and if the exhaust gases are still passing out of them it is only because the cylinder is contracting, the piston pushing the gases out, as it were.

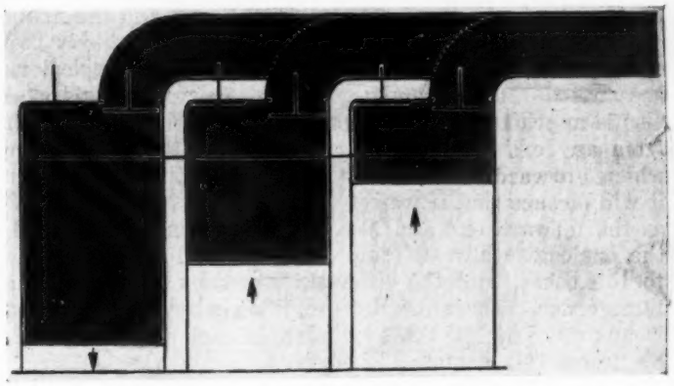


Fig. 2—Showing positions of pistons and their directions of motion in three cylinders of an eight-cylinder vertical engine which follow one another in the timing order, at the moment the exhaust valve of one begins to lift

Consequently, there is a chance for the gases which are pouring from the cylinder which has just entered upon its exhaust period, to enter both of these other cylinders. Of course, it is undesirable to have them enter either, because they will add to the back pressure on the piston in that cylinder, and, therefore, consume power. The chief objection to this blow-over, however, is that it prevents complete evacuation of the cylinders nearing the end of the exhaust stroke and makes it impossible for them to draw in a full charge during the following inlet stroke. The relative positions of the pistons in the three cylinders concerned (and their directions of motion), at the moment the exhaust valve in one of these cylinders begins to lift, are indicated in Fig. 2. The deepness of the shading is intended to show the pressure or density of the gases, and

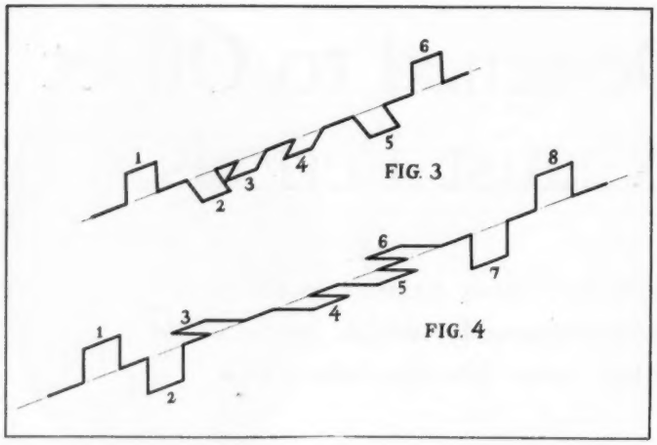


Fig. 3—Diagram of six-cylinder crankshaft
Fig. 4—Diagram of eight-cylinder crankshaft

since gases always tend to flow from a region of higher to one of lower pressure, the direction of gas flow can be seen from this diagram.

In a six-cylinder engine a similar overlapping of exhaust periods occurs, and in that case the difficulty can be readily overcome by arranging the cylinders in two groups of three, from each of which the exhaust gases are led away through a separate passage, at least for some distance. For instance, the crankshaft of the six-cylinder engine may be of the form shown in Fig. 3 and the firing order may be 1-4-2-6-3-5. In the six, of course, only two exhaust valves are open at the same time, since explosions are spaced 120 deg. and the exhaust period in this case also is approximately 240 deg. Consequently, the exhaust from any cylinder can blow over only into the cylinder which precedes it. Now, by referring to the firing order it will be seen that if we refer to cylinders Nos. 1, 2 and 3 as the forward end and Nos. 4, 5 and 6 as the rear end, the explosions always jump from one end of the engine to the other, and the exhausts naturally follow in the same order. Therefore, by providing a separate exhaust "lead-away" for the three cylinders of each end, it is possible to entirely obviate blow-over.

Element of Uncertainty

An element of uncertainty enters at this point of the invesigation in the case of the eight-cylinder vertical engine, and that has to do with time. Exhaust gases will not begin to enter the cylinders partly through their exhaust period, immediately the exhaust valve of another cylinder begins to lift. The very fact that the gases are still flowing from the two cylinders partly through their exhaust period, into the exhaust manifold, proves that the gaseous pressures within them at the moment the exhaust valve in the first cylinder begins to lift, are greater than the pressure in the manifold, and this condition must be reversed before any blow-over can occur. This, of course, takes some time, depending upon the rate of opening of the exhaust valve, the relative volume of the exhaust manifold and exhaust pipe, and the resistance to gaseous flow of the muffler. The time interval, expressed in degrees of crank motion, moreover, would depend upon the speed of revolution of the engine.

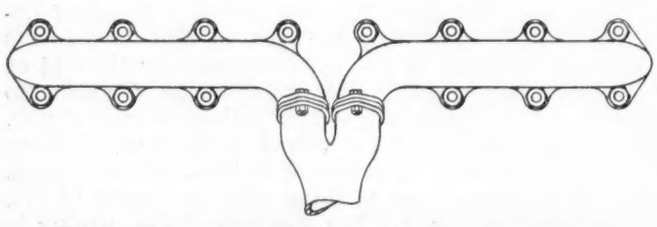


Fig 5—Exhaust manifold providing a separate lead-away for each set of four cylinders

It may be judged from the above that the interval in degrees of crank motion between the moment the exhaust valve in any cylinder begins to lift and the moment exhaust gases from the exhaust manifold begin to flow back into the cylinders which precede it in the timing order, varies from case to case. Some data the writer has available may give an idea of the order of magnitude of this interval. These are from a six-cylinder engine built a good many years ago. The timing of this engine is not accurately known, but presumably the exhaust valve began to lift about 45 deg. ahead of the bottom dead center.

A manograph diagram taken from this engine indicates that exhaust gases began to enter the preceding cylinder when its crank was about 45 deg. from the end of its exhaust stroke, or exactly 180 deg. from the crank position where the exhaust valve of the first cylinder began to lift. As the cranks of the two cylinders have an angular spacing of 120 deg., the lag of the blow-over behind the beginning of the exhaust period of the cylinder from which the gases come is therefore 180 — 120 = 60 deg.

Speed Quite Moderate

From the period at which this engine was built it may be assumed that its speed was quite moderate, not over 1200-1400 r.p.m., and in a high speed engine the lag might well be expected to be somewhat greater, even though the valves and the volume of the exhaust pipe are likely to be larger, relatively. If this is correct, then there is no danger of a blow-over from any given cylinder into one which precedes it by 180 deg. in the firing order, which is only 60 deg. from the end of its exhaust period at the moment the exhaust valve in the first cylinder begins to lift.

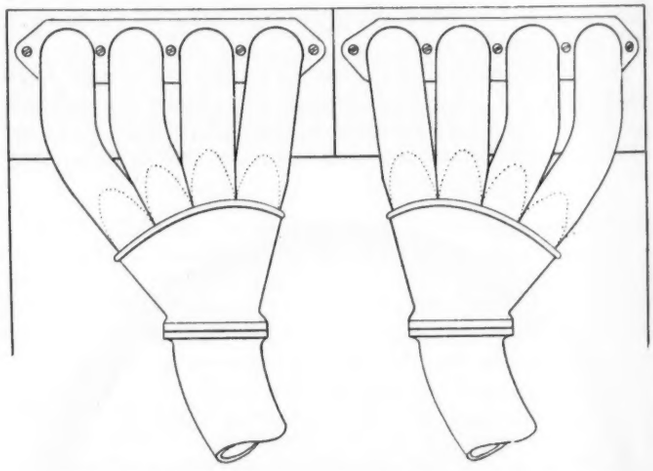


Fig. 6—Unusual exhaust manifold used on Bugatti vertical eight engine

A fact that tends to support this assumption is that no appreciable loss of power from blow-over seems to occur in four cylinder engines, in which the timing relation of cylinders following one another in the timing order is the same as that between cylinders following one another at intervals of 180 deg. of crank motion in the eight-cylinder engine. This condition, if it exists, is a most fortunate one, because it is impossible to arrange the firing order of an enght-cylinder vertical engine in such a way that the second cylinder to follow any particular cylinder in the firing order is always at "the other end" of the engine.

The four cylinders which come alternately in the firing order correspond to the crank throws in the same plane, that is, 1-2-7-8, for instance, and there are only two possible firing sequences for these four cylinders, namely 1-2-8-7 and 1-7-8-2. It will be noticed that with the first firing order, as cylinder No. 2 follows No. 1 the exhaust remains at the same end of the engine, and also as No. 7 follows No. 8. With the second firing order the exhaust

Fig. 7—Exhaust manifold giving an ejector effect

remains on the same end as No. 8 follows No. 7 and as No. 1 follows No. 2. Hence, if there was a blow-over into the second cylinder to follow, it would be necessary to seek the solution of the problem in a different way. Of course, the effect can be reduced to some extent by a change in the timing of the exhaust valve.

On the other hand, if there is a lag in the blow-over behind the beginning of the exhaust lift of at least 60 deg., as is indicated by the experimental data referred to in the foregoing, and the blow-over occurs into the cylinder immediately preceding, then it is quite easy to so arrange the firing order that explosions and exhausts always jump from the set of four cylinders at one end to the set at the other end, and by carrying the exhausts from each set of cylinders away separately, the blow-over can be prevented. For instance, with the crankshaft shown in Fig. 4, a firing order 1-6-2-5-8-3-7-4 may be used. The separate "lead-away' of the exhaust from the two sets of cylinders may be effected either as indicated in Fig. 5, which is similar to the arrangement used on the Panhard sleeve valve vertical eight, or as in Fig. 6, which shows the exhaust manifold of the Bugatti vertical eight.

Another method of preventing trouble from blow-over of exhaust gases consists in creating an ejector effect in the exhaust manifold. For instance, if the discharge from each exhaust valve enters the manifold header through a sort of nozzle pointing in the direction toward the muffler, the momentum of the gaseous stream will carry it past the nozzles from the cylinders which are at about the middle and near the end of their exhaust periods, respectively, and, rather than entering these nozzles, they will have a tendency to draw the remaining spent gases in these cylinders through the nozzles. (Fig. 7.)

The only objection to such a manifold is that it is rather difficult to manufacture. It could not well be cast as a whole and probably would have to be built up by welding. It would seem possible, however, to cast it in halves, match these accurately and then weld them together, preferably by butt-welding. It is the writer's belief that with such an exhaust manifold the output from an eight-cylinder vertical engine could be materially increased.

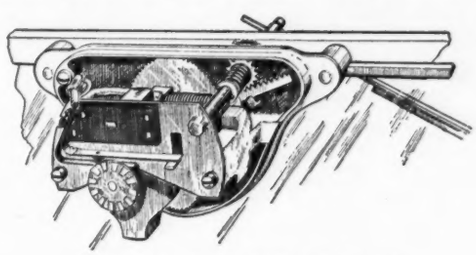
A TABLE which gives direct, without the need for any interpolation, the logarithm to five places for all numbers from 1 to 99,999 and which only occupies 46 pages of 5 by 8 in. type size is unique. When to this information is added the possibility of obtaining, also direct without interpolation, the anti-logarithm to five places of all numbers from 0.00000 to 0.99999 in the same space, the table verges on the impossible in the minds of those familiar with usual log tables. But this has been accomplished in a book "A Graphic Table Combining Logarithms and Anti-Logarithms" prepared by Adrien Lacroix and Charles L. Ragot and published by the Macmillan Co., New York.

By the application of graphical methods, they have evolved two tables, one giving five place logs and anti-logs from 1000 to 99,999 and the other giving four place logs and anti-logs from 1 to 999. Either logs or anti-logs can be read directly to five places and the sixth place estimated as accurately as slide rule interpolations can be made. Use of this method gives considerably quicker results than is possible with ordinary tables even when interpolation is unnecessary, and the authors claim that with the usual table the interpolated fifth place is not always accurate whereas their graphic table is in every instance.

To anyone who has occasion to use logarithms this graphic table will prove to be of great value in hastening their work and eliminating errors.

Dyneto Windshield Wiper

THE Owen Dyneto Corp., Syracuse, N. Y., builder of starting and lighting equipment, announces a new product, an electric windshield wiper, which is built in two models, a single arm type and a two arm tandem style. Instead of the usual wound armature and commutator, construction of the actuating mechanism consists of an oscillating unit comprising a three pointed malleable rotor back on which is a field coil made in two parts carrying a single winding. The rotor element



View showing details of Dyneto windshield wiper

revolves at 1400 r. p. m. which is reduced through the medium of a gear train to the slower speed needed for the wiper blades. Current consumption is said to be only 0.4 amperes. Control of the wiper is by means of a conventional switch on the face of wiper casting.

Warning of German Patent

AMERICAN exporters shipping automobiles into Germany fitted with disk wheels must take their chances on violation of disk wheel patents alleged to be owned under the "Napier patent for disk wheels in Germany." Word of warning to this effect has been sent to the Automotive Division of the U. S. Department of Commerce from the Commercial attache in Berlin.

The cable declares that "American cars probably will be confiscated when shipped into Germany with disk wheels unless a royalty has been paid to the representative of the company holding the Napier patent for disk wheels in Germany. A detailed investigation of the patent shows that it is not limited to disk wheels but rather concerns the feature of removable wheels without disturbing the driving or brake mechanism. It will be observed, however, that the alleged infringement is more to the interest of automobile manufacturers than to the producers of disk wheels," the Department is advised.

N. A. C. C.-S. A. E. Speakers Show How to Prevent Need for Service

Factories urged to help dealers establish periodic maintenance service. Designers should consider repair tools in changing models. Piece work pay favored.

By Donald Blanchard

INTEREST at the service engineering meeting held in Chicago, Nov. 9 and 10, under the joint auspices of the service committee of the National Automobile Chamber of Commerce and the Society of Automotive Engineers, centered around the general topic of reducing the cost of service to the car owner by prevention rather than cure.

Among the major subjects discussed in this connection were periodic maintenance, piece work compensation of mechanics, corrosion of engine parts, service tools, trouble diagnosis and fuels.

By getting owners to adopt a plan of periodic maintenance, which would bring their cars into the service stations at regular intervals, much trouble could be avoided and the cost of operation reduced. The importance of correct diagnosis of trouble also was stressed as it was admitted that frequently wrong interpretation of symptoms resulted in unnecessary work being done for which the owner was charged. In connection with piecework compensation, one of the features brought out was that this payment plan fosters the introduction of modern shop equipment which results in better work at less cost. It was also urged that engineers give more attention to the service tool equipment already in dealers' service stations when making changes in design as, if this were not done additional equipment had to be purchased, which added to the cost of doing the work.

Following the address of welcome by O. B. Zimmerman, International Harvester Co., G. Frank Lord, Durant Motors, Inc., presented a paper in which he emphasized the importance of periodic maintenance service as a means of preventing trouble and urged that car manufacturers assist their dealers in establishing systems which would bring owners into the shop at regular intervals for inspection, lubrication, and adjustment. He pointed out that other industries have found it profitable to furnish this type of service and that it is essential to the continued development of an automotive transportation system.

Although performance and cost of production are prime considerations in the design of a car, D. C. Hinckley, Hinckley-Myers Co., pointed out that often these objectives could be attained in a new model without making it necessary for the repairman to increase his investment in service tools materially. He cited one make of car which has had four new models in recent years on each of which small changes in the links had made it necessary for the service station to provide itself with a special wheel puller. To illustrate his point further, Mr. Hinckley suggested that crankshaft gears could be designed so that the repairman could handle a larger number of cars with a fewer number of pullers. As examples of what could be done by the engineer to hold down the repairman's investment in tools, mention was made of one car on which four wrench sizes fit all nuts and another which requires but six reamer sizes for all of its bushings.

At the session on corrosion of engine parts, the speakers were M. A. Thorne, Tidewater Oil Co., and Frank Jardine, Aluminum Co. of America. Corrosion of engine parts, it was shown, is evidenced by noisy operation, looseness in the timing chain, blow-by the piston and discoloration and pitting of parts. It is caused by sulphurous and sulphuric acid resulting from the combustion of the sulphur content of the fuel together with the water produced by combusition and the moisure contained in the air drawn in by the carbureter. As a direct result of combustion about 9 lbs. of water are produced for each gallon of fuel consumed but of course, a major portion of this goes out of the exhaust.

When the engine is started cold, water so formed will deposit on the cold surfaces of the engine and, unless

Eliminate the Weak Points to Reduce Service Costs

There is a growing conviction in the industry that the best way to reduce the cost of service is by prevention rather than cure.

Discussion at the Joint Service Meeting of the National Automobile Chamber of Commerce and the Society of Automotive Engineers in Chicago last week centered around that subject. The topics discussed included:

1. **Periodic Maintenance.**
2. **Piece-work Payment for Mechanics.**
3. **Corrosion of Engine Parts.**
4. **Service Tools.**
5. **Trouble Diagnosis.**
6. **Fuels.**

This article tells the story of the meeting and of the discussions.

fresh lubricant is supplied at once, the oil film left when the engine was stopped will be destroyed and trouble will result. Moreover, if the engine is stopped while it is still cold, condensation will take place, causing the destruction of the oil film and rusting will commence. Corrosion takes place very rapidly in isolated portions of the crankcase where the ventilation is poor and where the metal does not warm. An example of this is the front end of the engine. The timing gear cover is exposed to the blast of the fan and in cold weather it will usually be relatively cold. As a result condensation is accelerated and corrosion of the front end drive follows.

Cold Room Experiments

Mr. Jardine described some cold room experiments in which the engine was started from 10 deg. F. with cold water circulating through the jackets. It was found that condensation continued for from 2 to 10 minutes and longer on parts which did not heat up quickly. After taking the engine down, ice was found in the oil-pan and finely divided water in the oil which would not settle out but which did clog the oil screen. If the engine is stopped with water on the cylinder walls, rust forms within half an hour.

The only successful way, according to Mr. Jardine, of preventing condensation on and consequent rusting of the cylinder walls, is to provide a lubricating system that will supply oil to these surfaces as soon as the engine starts. This requirement is met by the splash system. In pressure systems, he recommended placing the pump in the sump as in a higher position it might not be able to lift a cold, viscous oil; the use of a 30 mesh or coarser oil screen; oil lines ½ in. or more in diameter; a bypass around the oil screen so that clogging will not stop circulation; clearances at the connecting rod bearings of .0015 in. on the diameter and .006 to .008 in. at the sides, and the use of light oils in winter.

Mr. Jardine stated that road tests have not confirmed the belief that the use of thin or diluted oils promotes cylinder and piston wear. He found that with a half and half mixture of oil and kerosene, cylinder wear amounted to .00025 in. after 5,000 miles at speeds averaging above 40 m.p.h. while with straight oil the wear was twice as rapid under the same condition.

On engines and parts to be stored for any considerable length of time in cold weather, he recommended a protective coating of castor oil as it has been found to be more resistant to the destructive action of water than mineral oil.

Reducing Corrosion of Parts

Mr. Thorne said that much could be accomplished to reduce corrosion of engine parts generally by improvements in piston design and installation which will reduce blow-by; by reducing the warming up period and maintaining the crankcase temperature sufficiently high to eliminate water from the oil and prevent condensation; and by ventilation of the crankcase. The adoption of steam or oil cooling with provision for controlled heating of the crankcase, offers favorable features in the solution of this problem, and passing pro-heated air through the crankcase also will help.

As these remedies are all a matter of engineering and beyond the abilities of the service man, Mr. Thorne said that on existing equipment, radiator shutters, thermostatic control of cooling systems, continuous oil heating devices, oil filters and venting would tend to minimize corrosion. The importance of crankcase ventilation is indicated by the fact that corrosion is worse in engines of six or more cylinders and this is attributable to the greater pumping action of the four.

It developed during the discussion that corrosion troubles have been most prevalent around Birmingham, Ala., where benzol fuel is used extensively. This type of fuel was not held to be the cause of the difficulties. The blame was placed on its makers as analyses are said to show that the sulphur content is unnecessarily high, indicating improper refining. Government gasoline specifications limit the sulphur content to 0.1 per cent and this maximum is generally accepted as good practice although it is admitted that fuel with much higher percentages is being sold. It was suggested that federal legislation along the lines of the pure food act would help the situation.

The possibilities of using non-corrosive steels were discussed. In the past it was stated that materials of sufficient hardness for such parts as piston pins and which resisted corrosion, were not available. Recently, however, high chromium steels have been developed which can be hardened and which also resist corrosion.

A representative of the Fageol company described the oil purifying system used on the Hall-Scott engines in their buses. Solid material, slush and water is removed by a felt filter and then the oil is pumped up over the cylinder heads where fuel diluent is removed. With this system, they have found it necessary to change oil at about 2500 mile intervals.

A telegram from G. A. Round, Vacuum Oil Co., was read in which he stated that investigations just completed showed that the resistance offered by screens to the flow of oil was tremendous and that it varies inversely as the fourth power of the openings. This is further evidence of the desirability of using coarse oil screens. They can be depended upon only to remove the coarser impurities as much of the solid material in the oil is so minute that it passes through even the finest screen.

Diagnosis of Trouble

Diagnosis of trouble was covered in a detailed manner by J. C. Talcott, Pierce-Arrow Motor Car Co. In this paper, each unit was taken up separately, the symptoms of trouble were described and the interpretation of these symptoms given.

The paper presented by John Squires and Carl Breer of the Chrysler Corp., was really a history of the development of an organization to service the Chrysler. Although the design of this car is along standard lines, except for a few features, it was found that service men in the field felt that it was different and consequently lacked confidence in handling it.

Much trouble was experienced also as a result of the failure on the part of the dealer service man to follow factory instructions, particularly as regards adjustments. The importance of the right kind of personal contact with owners and the effect it has on sales was not generally realized.

To meet these conditions, a field service corps was organized. The members of this group were thoroughly trained and were required to be able to diagnose and fix any trouble which might develop. These men are brought to the factory quarterly for further instruction and then they go out into their territories where they hold similar meetings among service men at which they pass the information along. Of course, such instruction is supplemented by technical bulletins but the oral method of transmitting instructions has been found most effective.

A real instruction book was also emphasized as an important factor and an effort is made to get dealers to have one of their service men spend half an hour going over this book with each new owner.

Leakage past valve stems changes mixture proportions despite the effectiveness of the carburetion and manifolding with resultant loss of power, increase in crankcase

dilution and rough operation, according to Frederick Alberty who recommended the use of the felt packing at the top of the valve guide to insure tightness at this point. A method of testing an automobile which informs its owner as to its condition, was described by F. E. Edwards.

The automobile is a chemical factory on wheels, according to T. A. Boyd, General Motors Corp., who talked on fuel from the service standpoint. He explained that the raw materials are air and gasoline and the output carbon dioxide, carbon monoxide, water and nitrogen.

Not much trouble is experienced with foreign matter in fuel provided the channels of supply are kept clean. Some cracked gasolines will give a brown residue which will deposit itself on heated parts such as manifolds and carbureters. The formation of this residue, which results from improper manufacture, is accelerated by storage in a warm place. It may be removed most easily with acetone. In addition to corroding iron and steel parts, sulphur in the fuel will also attack brass and copper parts in some cases.

Mr. Boyd urged service men to pay more attention to economy, not merely to reduce operating costs but also to conserve our fuel supply. In this connection the heat content of benzol is somewhat higher and somewhat leaner mixtures may be used.

The writer presented a paper describing the various new devices which have been developed to improve motor car operation. Among those mentioned were the Cadillac crankcase ventilating system, the Marmon purifier, the Kingston aerator, the Bijur chassis lubricating system, the Rushmore steam cooling system and the Oakland harmonic balancer. Discussion following this paper centered chiefly around steam cooling.

Judging from expressions of opinion at the Question Hour which closed the convention, the car factories are sold on piece work compensation of service mechanics. It was pointed out that it is likely to be an important factor in getting men who are now going into other industries because of higher pay to enter the service business because the piece work plan enables them to earn as much or more than they could obtain elsewhere. A number of examples were cited where the adoption of this method has turned losses into profits.

Trailer Has Automatic Braking Arrangement

FIFTH-WHEEL construction at the front axle and automatic brake operation are the outstanding features of the new Lapeer trailer which has been added to the line of semi-trailers made by the Lapeer Trailer Corporation of Lapeer, Mich.

Four sizes of the new trailer are standard and their rated load capacities are 2, 4, 6 and 10 tons respectively. The length overall of the frame is 12 ft. for the smallest size, 16 ft. for the 10-ton size and 14 ft. for the intermediate sizes. Springs on all sizes are 50 in. long, with depth ranging from 3 in. for the 2-ton trailer to 5 in. on the 10-ton unit, the number of leaves being 11 and 21 respectively. Rolled steel channel frame members are 6 in. deep on the two smaller trailers and 7 in. deep on the two larger sizes.

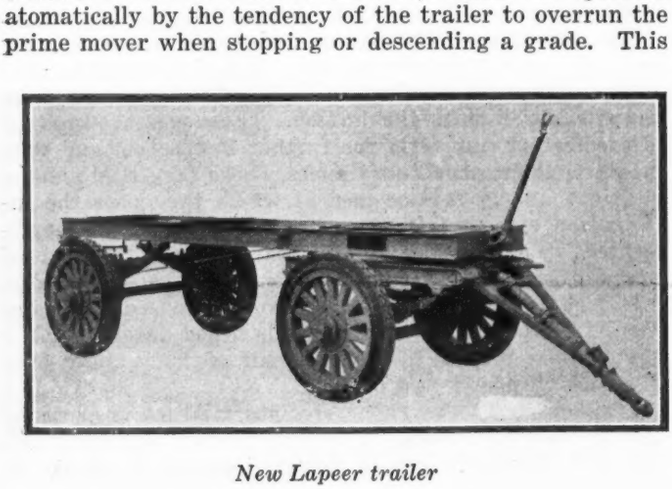
All wheels are mounted on Timken taper roller bearings. The front axle has a dropped center section, while the rear axle is straight. Both axles are rectangular section forgings. Wheel diameter in all cases is 36 in. Solid tires and artillery wheels are standard construction.

Internal expanding brakes are fitted to all rear wheels and here again the size varies with the capacity of the trailer. As in the semi-trailer line, brakes are operated atomatically by the tendency of the trailer to overrun the prime mover when stopping or descending a grade. This action is secured by a push rod which engages with the rear end of the tubular center portion of the tongue. The trailer is attached to the unit ahead by a forged eye at the front end of the tubular section, which is held taut in the forward position by a concealed spring. When the trailer tends to overrun, the spring is overcome, forcing the tubular tongue back against the front end of the pushrod. The rear end of the pushrod pushes against the lower end of a lever which is located at the center of the fifth wheel, thus allowing braking action when the front wheels are at an angle with the body of the trailer. From the upper end of this lever a short rod connects with another lever on the cross shaft from the outer ends of which conventional levers and brake rods connect with the brakes.

As shown, the trailer is equipped with an auxiliary hand lever for manual operation of the brakes. The automatic feature is effective at all times and hand braking is available for locking the trailer when separate from the hauling unit.

The fifth wheel in these trailers is of standard make and is equipped with roller bearings, the rollers being mounted in a cage arrangement which resembles that of the smaller bearings common to automotive practice.

Treads of the various sizes vary to conform with the average treads of the units behind which they are to be pulled. In the 2-ton size the tread is 56 in., for the 4-ton size the figure is 60 in., and for the 6-ton, 62 in., and the 10-ton trailer has a tread of 68 in. When desired these trailers can be purchased without the special hitch and braking attachment.



New Lapeer trailer

INFORMATION as to how American travelers can arrange to take their cars with them into the various countries of Europe and adjacent Mediterranean areas without being subjected to tedious customs formalities is detailed in a Department of Commerce publication. In addition the pamphlet contains a summary of local touring regulations in the several European countries, and information on the customs regulations concerning baggage and what travelers may carry in with them without the imposition of heavy duties.

THE FORUM

The Automotive Engineer—Is He Falling Down on the Job?

Charge is made that inventive ability has been turned from the fundamental to the trivial. Opportunities for improvement cited.

Editor AUTOMOTIVE INDUSTRIES:

The history of all branches of engineering has been similar in that it has progressed through similar stages. First the men of science working in laboratory and shop, Newton, Faraday or Gallileo. Then the great appliers of known science, Watt of the steam engine or Stephenson of the railroad. Throughout the last century, in steam, in ships, in bridges or in rails, great accomplishments made great names. Lastly, with almost all the pioneering done, the great engineers vanish, their profession relegated to a cut and dried routine; progress slows down, the imagination of genius is no longer stirred.

Reaching Last Stage Too Soon

The automobile industry is hastening into the last stage too soon. It is to be regretted because it is a stultifying stage, a stage which holds back from the world good things it might otherwise possess. The railroads we have are not the railroads we ought to have. If the job was to do again we could and would have faster, safer and much cheaper service. We could get much cheaper electricity from the coal we burn if we could scrap most of the existing equipment and start anew. The prohibitive thing, the thing which keeps better railroads and cheaper power away, is the enormous investment in existing equipment; the immense cost of making over.

Now the automobile ought not to suffer from this malady of mass, because unlike a bridge, a power plant or a railroad track it is a distinctly consumable article. In the factories it is just as easy to make changes of real value as to alter a few body lines or change the kind of paint employed. But for all that the engineer with real vision finds little scope in automobile design. In the last ten years there has only been one real advance—the four wheel brake—and that was largely forced upon reluctant engineering departments by sales managers with vision.

Still Have Wasteful Engines

We still have with us engines that waste 95 per cent of the gasoline fed to them, transmission systems that only one driver in a good many hundred can handle expeditiously and an average weight of vehicle twice what it could be. There is enough engineering knowledge and skill in the world to improve the automobile even more than it has already been improved in the last twenty years, but despite this fact it is a rare thing to see a new model that betrays any real engineering inspiration.

It is not invention that is lacking; it is rather that inventive ability seems to have turned from the fundamenal to the trivial and superficial. Gadgets and doodads appeal more, or are supposed so to appeal, than things which would make cars safer and more economical to operate.

With increasingly violent competition it is surprising that low maintenance cost has not been given much notice as a sales argument. Economically, the less the country spends in running automobiles the more money it has for buying new ones. If my car cost me half as much to run I should not drive it twice as far. On the other hand, there are thousands of owners in every section of the country who would run many more miles if gasoline and tires were still cheaper, and when their machines stand idle they are not wearing out and making way for replacements. However you look at it, lowering operating cost could not fail to stimulate sales.

Small Changes Would Help

Cheaper operation is to be gotten by lots of little changes, not necessarily by some spectacular new engine but by the more careful and much more thorough application of existing knowledge to the type of engine that we have. Not by the discovery of some new material, but by the more scientific application of the materials we now employ.

There are many engineers who could do these things and are not given scope by lack of vision above them in their organizations, and there are perhaps still more occupying engineering positions who could not. The name engineer in the automobile field carries neither the dignity nor the respect it did even ten years back. Many of our pioneers who did the great deeds of the early nineteens have dropped out and the new men who come in find more scope and more appreciation on the manufacturing side than on that of true engineering or design.

Yet the world is producing and training more and more engineers every year and real talent is more readily obtainable than ever before. It is a sad thing if the automobile industry is really ceasing to attract the creative type of man.

A. LUDLOW CLAYDEN.

Closer Insight is Gained Into Physical Properties of Stellite

Recent tests show that it retains hardness up to very high temperature and thus permits high cutting speeds. Melting point, mechanical strength and specific gravity also found.

ALTHOUGH Stellite, the metal-cutting alloy invented by the late Elwood Haynes, has been on the market for a long time, and although it is generally known that its outstanding characteristics are great hardness and retention of this hardness up to very high temperatures, little has been known in the engineering world regarding its other properties. Recently a series of systematic tests on the alloy were carried out by the Union Carbide and Carbon Research Laboratory, Inc., and the results of these tests have been collated in a pamphlet entitled "Properties of Haynes Stellite," which has been published by the Haynes Stellite Co., of Kokomo, Ind.

Haynes Stellite is made in three ordinary and several special grades, all of which are ternary alloys of chromium, cobalt and tungsten. Grades Nos. 2 and 3, which are used for metal cutting, acquire their hardness at the moment of solidification and cannot be rendered any harder by any subsequent treatment. They cannot be forged or machined and can be shaped only by casting and grinding. These alloys retain their hardness up to a temperature of 1830 deg. F., or a bright red. Grade No. 3 is slightly harder than Grade No. 2 and retains its hardness to a somewhat higher temperature, but it is not quite as strong and, therefore, must not be used in cases where excessive shocks and stresses may occur.

Third Grade Can be Forged

The third grade, known as No. 6 Stellite, differs from the others in that it can be forged, rolled and stamped at 1830 deg. F., which permits of its use for purposes from which the other two grades are excluded. No. 6 is not equal to the other grades in respect to hardness, but it is comparable to them in respect to resistance to abrasion and corrosion, and it is of greater strength.

All grades of Stellite can be deposited upon iron and steel by an oxy-acetylene fusion welding process known as Stelliting. This process is made use of for surfacing heavy parts of machinery which would be unduly expensive if made completely of Stellite, and in the manufacture of parts requiring a combination of great mechanical strength with unusual resistance to heat, abrasion and corrosion.

The most important property of Stellite is that of retaining its hardness up to a very high temperature (1830 deg. F.), which is said to be about twice the temperature at which high speed steel begins to soften. In addition to this red-hardness, Stellite has the property of regaining its original hardness upon cooling, provided it has not been heated much above 1830 deg. F. These two properties make Stellite eminently suited to machining other metals, in spite of the fact that at normal temperatures and up to 1100 deg. F. it is not quite as hard as the hardest of plain carbon and high speed alloy steels.

A comparison of the hardness of the various grades of Stellite and of high speed steel at room temperature is made in Table I.

Table I

Hardness at Room Temperature

	Rockwell	Brinell	Scleroscope
Stellite No. 2	C60	555	66
Stellite No. 3	C60	570	68
Stellite No. 6 cast	C48	418	47
Stellite No. 6 forged	C48	444	52
High-speed steel, hardened	C61	627	70

(In the minerologic scale, Stellites Nos. 2 and 3 are nearly as hard as quartz.)

When heated to 1830 deg. F. and cooled, the hardness of Stellite compares with that of high speed steel subjected to the same treatment as shown in the following table:

Hardness after Cooling from 1830 deg. F.

	Rockwell
Stellite No. 2	C60
Stellite No. 3	C61
High Speed Steel	C54

The retention of its hardness at high temperatures permits a Stellite tool to be worked at higher speed than would be permissible with a steel tool, and it is claimed that in consequence shop output can be increased by from 20 to 200 per cent. The red-hardness of Stellite has another advantage in that in the shop it means less frequent changing of tools and less grinding. Table II shows the increase in shop output and in work performed for each grinding of a tool, at a number of metal-working plants where opportunity was afforded to make a direct comparison between Stellite and high speed steel.

Table II

Increases in Shop Output and Tool Performance on Identical Work When High-speed Steel was Replaced by Stellite

Material, and Nature of Work	Increase in Shop Output, based on Floor to Floor Time	Increase in Number of Pieces per Grind, based on One Grinding of Steel Tool
Cast iron, turning	20 to 88%	2 to 10 times
Cast iron, milling	30 to 100%	2 to 9 times
Cast iron, boring	30 to 110%	2 to 5 times
Mild Steel, turning	30 to 110%	2 to 6 times
Mild Steel, milling	25 to 55%	2 to 3 times
Mild Steel, boring	30 to 250%	2 to 6 times

To test the breaking strength of Stellite tools, samples of every heat are tested by a method designed to exaggerate the adverse conditions under which the cutting tool will be used. A½ in. square bar is held horizontally in a clamp, and a vertical load is applied 1 in. from the point of support, the load being increased until the bar breaks. A large number of tests have shown an average breaking strength of 2,500 pounds under these conditions for Grades Nos. 2 and 3. Calculations, supported by tests, are said to show that the load carried by a tool of this

size, cutting in steel, ranges from 800 to 1000 pounds, while in cast iron, of course, it is considerably less. Moreover, the normal overhang of the tool is considerably less than 1 in., usually only about ½ in.

Stellite is also known for its great resistance to abrasion. Tests for this quality have not yet been standardized, but Table III gives the results of a number of such tests.

Table III

Relative Resistance of Stellite as Compared with Steel, to Wear by Abrasion

Bureau of Standards investigation of plug gauges	4 to 6 times
Abrasion test by a large rubber manufacturer	6 times
Test by manufacturer of grinding machines	4 times
Factory test of die for drawing steel	9 times

Compression tests made in the usual manner on Stellites of different grades gave the average results shown in Table IV.

Table IV

Compressive Strength of Stellite, Pounds per Square Inch

Stellite No. 2	296,000
Stellite No. 3	306,000
Stellite No. 6, cast	275,000
Stellite No. 6, forged	335,000
Hardened high-speed alloy steel	392,000

Grades No. 2 and No. 3 show no tendency to flow under a crushing load, while specimens of No. 6 sometimes fail by bending under compression.

Tensile tests on ½-inch square bars at room temperature gave the average results shown in Table V.

Table V

Tensile Strength of Haynes Stellite Pounds per Square Inch

Stellite No. 2	43,000
Stellite No. 3	38,000
Stellite No. 6, cast	76,000
Stellite No. 6, forged	134,000

In general, the elastic limit of cast Stellite lies close to its ultimate tensile strength. Elongation rarely exceeds 0.5 per cent, and reduction of area is too small to be detected.

In certain applications, especially in cases where it is difficult to lubricate the contact surfaces of moving parts, the ability of Stellite to take a very smooth finish, which results in a low coefficient of friction, is of importance. The coefficient of friction between two polished, dry surfaces of Stellite is 0.11, which is materially lower than that between surfaces of most other metals in the dry condition. This great smoothness also is valuable property in connection with the burnishing of soft metals. It has been found that Stellite burnishing tools have no tendency to pick up flakes and threads of the softer metal.

Table VI gives the average results of a number of specific gravity determinations:

Table VI

Density of Stellite

	Specific Gravity	Weight per Cubic Inch, Pounds
Stellite No. 2	8.52	0.309
Stellite No. 3	8.54	0.311
Stellite No. 6, cast	8.25	0.297
Stellite No. 6, forged	8.25	0.297
Carbon steel	7.70	0.278

In general, the Stellites are seen to be 7 to 10 per cent heavier than carbon steel.

Table VII

Approximate Melting Points of Stellite, Fahrenheit

Stellite No. 2	2285°
Stellite No. 3	2336°
Stellite No. 6	2327°
Gray cast iron	2228°
Steel (0.5% carbon)	2500°

The fact that the melting point of Stellite lies close to the melting points of iron and steel is of importance in connection with the fusion welding process referred to in the foregoing, as it assures a firm bond between the alloy and the base metal. It is worth nothing that in spite of the high red-hardness the melting point is not particularly high.

Coefficients of thermal expansion of Stellite for different temperature ranges have been determined by the Bureau of Standards, and the results are given in Table VIII. The proximity of the thermal expansion coefficients of Stellite and steel also facilitates the welding operation and tends to prevent cracking of the weld on cooling.

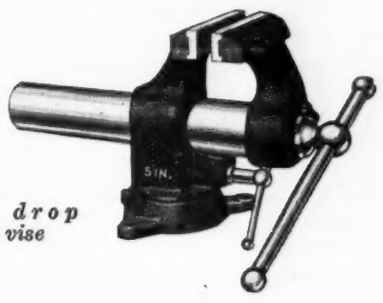
Table VIII

Coefficient of Expansion of Stellite for 1 Degree Centigrade

Temperature range, Centigrade	20° to 300°	300° to 600°	20° to 600°
Stellite No. 2	0.000,012,4	0.000,014,7	0.000,013,6
Stellite No. 6, cast	0,000,015	0.000,018	0.000,016,5
Stellite No. 6, forged	0.000,013,2	0.000,015,8	0.000,014,6
Cast iron	.....	.....	0.000,009,8
Carbon steel	.....	.....	0.000,014,5

Drop Forged Bench Vise

A BENCH vise, made entirely of steel drop forgings except the handle and which is fully interchangeable with any other vise of the same size, has been developed by the Fulton Drop Forge Co., of Canal Fulton, Ohio. The jaw plates are knurled and forged under a hammer and are doweled to the jaw so that they may be replaced if necessary. The vise is made with a

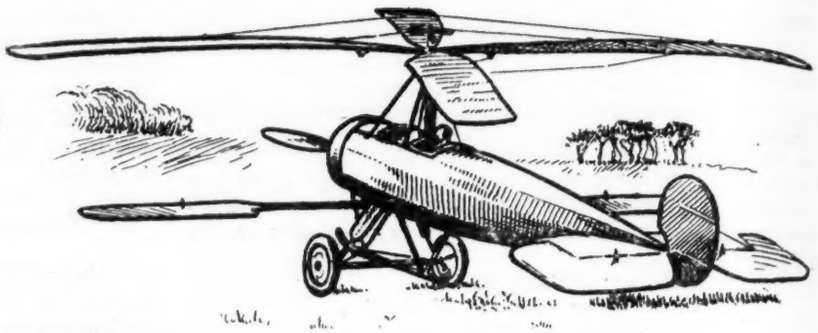


"Dropfo" drop forged vise

swivel base and positive wedge lock, or in the stationary type. It has been given the trade name "Dropfo" and is made in four sizes: 3 in. with jaws opening 5½ in.; 4 in. with jaws opening 6 in.; 5 in. with jaws opening 8 in., and 5 in. heavy duty with jaws opening 8 in.

A REVISION of the system of numbering ball bearings according to type is contemplated by the S. A. E. Standards Committee. The separable (open) type is to have numbers 5-19; the extra small series, 30-35; the radial light series, the 200 range; the radial medium series, the 300 range; the radial heavy series, the 400 range; the wide type light, medium and heavy series are to have the 5200, 5300 and 5400 ranges and the angular contact light, medium and heavy series are to have the 7200, 7300 and 7400 ranges. Variations from standard types will continue to be indicated by letters chosen by individual manufacturers. For instance, a No. 205 bearing of the type containing the maximum number of balls may be designated a 205-M and the Conrad type of the same size as a 205-C. A proposal made by F. G. Hughes, to increase the widths of the wide series of ball bearings up to No. 218 (or 5218), met with the approval of the Ball and Roller Bearing Division.

Rotating Planes Above Fuselage Are Used on Cierva's Helicopter



Two views of the Auto-Giro machine.

Free-moving, lifting airscrew with blades hinged at the roots is mounted on standard fuselage without wings.

By M. W. Bourdon

THE Cierva Auto-Giro flying machine—a Spanish invention—embodies a novel method of supporting and lifting a fuselage, in that, instead of normal wings, there are large rotating planes above the fuselage which supply the sustaining force and enable the machine to ascend or descend with very little forward motion.

The experimental machine, demonstrated recently for the British Air Ministry, is merely an ordinary Avro fuselage with a 130 hp. engine driving a propeller as usual, but with the wings removed and a central pillar installed. Attached to and radiating from the latter are four narrow planes of some 17 ft. span in the same horizontal plane but set at a slight incidence to the flight path. These planes are on a vertical shaft that runs freely and is not driven in any way by the power plant. When they are revolving at about 120 r.p.m. they exert sufficient force to lift the machine and opening up the engine to secure forward movement results in a backward rush of air that sets the planes rotating. Actually they are started by hand operation until they reach about 60 r.p.m.

Cannot be Stalled

The planes appear to have sufficient excess of lift over drag under all conditions, with the result that it is impossible to stall the machine in the ordinary way, and even if the engine fails the air pressure on the planes insures that the machine is still air-borne in sinking. The only controls needed are a rudder and elevators used normally. The blades of the lifting airscrew are hinged at their roots to avoid gyroscopic stresses and this feature, it is said, has proved to be the key to success after many failures. Not only are gyroscopic stresses wiped out, the inventor says, but the blades have a flapping motion closely analogous to that of a bird, which increases the incidence and lift on the retiring blades and decreases those factors on the advancing blades.

In experimental flights validity of the inventor's claims was proved by bringing the machine down hard at an angle of about 60 degrees to the horizontal. It sank heavily on an oleo under-carriage specially fitted that morning and stopped dead in about two yards. Afterwards the machine was given an extended flight, turning and climbing and once stalling to make it sink steadily under complete control. A gliding landing was then made with a very short run after touching ground. Finally the machine was taken up and brought down gently to make a light landing and even then the run was not more than the length of the machine.

The first question to be considered after it has been seen that the machine will fly is what relation exists between the load lifted and the horsepower required for the lift. The experimental machine is admittedly a makeshift, and its factor of safety is so abnormally high that no real comparison can be made between the auto-giro and an ordinary airplane. As a matter of interest it may be stated that the experimental Auto-Giro weighs, with its pilot and gasoline, about 2,000 lb. and can reach a forward speed of 68 m.p.h.; a comparable Avro will weigh about 1,900 lb. and has a forward speed of 88 m.p.h.

Recently the machine successfully emerged from a test of its ability to make a vertical descent. Captain Courtney, the Royal Air Force pilot, who has been testing the machine on behalf of the Air Ministry, came down from 150 ft. quite steadily and practically vertically at a rate of descent estimated at 12-15 ft. per second—slower than that of a parachute. It was previously expected that the Avro under-carriage would not withstand the shock of the landing in that way, and the fact that in landing it broke two struts in the under-carriage caused no surprise, though the incident as a whole led to reports being widely circulated in the press the same evening to the effect that the Auto-Giro had "crashed."

All the tests the Air Ministry originally specified having been carried through successfully, it is probable that the Ministry will now build a special machine embodying the features of the Auto-Giro to test other qualities and compare its practical efficiency with that of an ordinary airplane under conditions more favorable to the securing of reliable comparative data.

COMPETENT members of the machine tool trade in Great Britain estimate that between 25 and 30 per cent of the machine tool equipment in British automotive plants is of American manufacture, says Assistant Trade Commissioner W. M. Park, London, in a report to the Department of Commerce. He says the ratio in the British automotive industry is considerably higher than in other industries but makes the conservative estimate that the average for all plants would not be lower than the 10 per cent figure.